EPIC MINING PTY LIMITED

PRELIMINARY SITE INVESTIGATION AND FOCUSSED ENVIRONMENTAL SITE ASSESSMENT 2470 ELIZABETH DRIVE, LUDDENHAM NSW

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Liverpool City Council

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EXECUTIVE SUMMARY

National Integrated Creative Solutions was commissioned by Epic Mining Pty Limited (the proponent) to prepare a Stage 1: Preliminary Site Investigation (PSI) for the proposed stockpiling site as part of a Development Consent modification application No 4. The PSI was requested by Liverpool City Council despite the fact that the site has been used as rural residential for over 60 years and no other activities including agriculture for the last 15-20 years since the closure of a former dairy decades ago. The proposed site is located at2470 Elizabeth Drive, Luddenham NSW (also known as 285 Adams Road, Luddenham).

This study should be considered as the benchmark/background indicator of the quality of soil on that site so it can be used as reference at the completion of the development.

The land area is approximately 11 hectares (110,000 m^2), however only a portion of the land is the subject of the development (stockpiling activities) and hence the study will focus on this area of approximately 6.5 ha (65,000 m^2).

In accordance with Liverpool Local Environmental Plan 2008 (LLEP 2008), the land and obviously the proposed site is located within the land is zoned RU1 – Primary Production. The proposed activities, being stockpiling activities of quarried materials are part of the primary production activities classified as Extractive Industries, and are permitted within this zone.

To be able to get a better understanding of the history of the site, we have reviewed all available current and relevant historical documents.

In this report, we have made an assessment of all potential environmental concerns and contaminants that may have caused or are likely to cause an adverse impact on human health or the environment. Our main focus was on potential contamination of soil since the proposed activities are above ground and dry in nature, and the proposed environmental mitigation measures will prevent any potential pollution of waterways or groundwater. The closest waterway is Oaky Creek which is adjacent to the Eastern Boundary of the site but outside the stockpiling footprint.

Based on our assessment, the findings, conclusions and recommendations are presented in this document.

Based on the previous inspections of the site as part of the assessments associated with the preparation of the Environmental Assessment Report (EAR) and the most recent inspections dedicated specifically for this assessment, we were unable to find any visual evidence of past or current contamination within the inspected areas. However, it appeared that the site has only been used mainly for rural residential purposes for many years.

To confirm our findings, we have undertaken a focussed Stage 2 – Environmental Site Assessment rather than a Stage 2 – Detailed Site Assessment as we believe that the latter is not warranted nor required for the proposed development.

ABBREVIATIONS & GLOSSARY OF TERMS

Appropriate Regulatory Authority (ARA)	Generally, the appropriate regulatory authority is the EPA for licensed premises and the local council for non-licensed premises. There are exceptions to this definition as stated in Clause 6 of the POEO Act.
BCA	Building Code of Australia
Council	Liverpool City Council
EAR	Environmental Assessment Report
EPA	NSW Environment Protection Authority
Environment	As defined in the POEO Act, *"environment" means components of the earth, including:* *(a) land, air and water, and* *(b) any layer of the atmosphere, and* *(c) any organic or inorganic matter and any living organism, and* *(d) human-made or modified structures and areas,* *and includes interacting natural ecosystems that include components referred to in paragraphs (a)-(c).*
Harm	As defined in the POEO Act, *"harm" to the environment includes any direct or indirect alteration of the environment that has the effect of degrading the environment and, without limiting the generality of the above, includes any act or omission that results in pollution.*
Material risk of harm	"Material risk of harm to the environment" is defined under Section 147 of the POEO Act as: *(a) harm to the environment is material if:* *(i) It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or* *(ii) It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and* (b) *loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.*
NPWS	National Parks and Wildlife Services

Occupier	As defined under the POEO Act, *"occupier" of premises means the person who has the management or control of the premises.*
POEO Act	Protection of the Environment Operations Act 1997
Pollution	As defined under the POEO Act*, "pollution" means:* *(a) water pollution, or* *(b) air pollution, or* *(c) noise pollution, or* *(d) land pollution.*
Pollution Incident	The *Environmental Guidelines: Preparation of pollution incident response management plans* defines a pollution incident as: "…an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise."
Premises	As defined under the POEO Act*, "premises" includes:* *(a) a building or structure, or* *(b) land or a place (whether enclosed or built on or not), or* *(c) a mobile plant, vehicle, vessel or aircraft.*
Prevention of pollution	Use of processes, practices, materials or products that avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution. Note: The potential benefits of prevention of pollution include the reduction of adverse environmental impacts, improved efficiency and reduced costs.
RMS	Roads & Maritime Services
Site	2470 Elizabeth Drive, Luddenham NSW (also known as 285 Adams Road, Luddenham).
Epic	Epic Mining Pty Limited which is the proposed occupier of the site subject to the Development Application modification No 4. It is referred to in this document also as the proponent.

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1. INTRODUCTION

National Integrated Creative Solutions (NICS) engineers and scientists have undertaken a comprehensive study which included a Stage 1 – Preliminary Site Investigation (PSI) and a targeted Stage 2 – Environmental Site Investigation at a relevant portion of 2470 Elizabeth Drive, Luddenham NSW (also known as 285 Adams Road, Luddenham) as shown in **Figure 1-1**. It should be noted that the stockpiling activities will only be undertaken within a specified portion of this site since the rural residential activities will continue being present on the remainder of the site. Hence, the investigation is focussed on the former part of the site. **Figure 1-2** shows the proposed stockpiling footprint which is the main focus of this investigation.

Notwithstanding the above, it was considered appropriate to refer to several policies and guidelines prepared and/or adopted by NSW State and Local Government Departments including the Environment Protection Authority (EPA), the Department of Planning and Environment (DPE) and Liverpool City Council (Council), and the assessment has been undertaken in accordance with the requirements of these guidelines, where relevant.

The Reference Section of this document includes a comprehensive list of documents consulted during the assessment and the preparation of this report. Below are two (2) of the most relevant documents.

1 The National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) as amended in 2013. This document constitutes the most updated tool for Consultants in undertaking assessments on contaminated lands

2 Guidelines for Consultants Reporting on Contaminated Sites (OEH September 2011)

Figure 1-1: 2470 Elizabeth Drive, Luddenham

Figure 1-2: Proposed Stockpiling Footprint within 2470 Elizabeth Drive, Luddenham

1.1 SCOPE OF WORKS

To provide all stakeholders with greater confidence, it was determined that a list of agreed scope of works for this investigation be outlined clearly at the outset of this document and is outlined below.

1 Undertake a Stage 1 – Preliminary Site Investigation (PSI) which includes the following:
- Conduct comprehensive site inspections to identify any potential areas impacted by contamination,
- Examine available past and current site layouts,
- Determine the potential pathways contaminants may take to reach topsoil, subsoil, waterways and groundwater,
- Review the site history,
- Obtain and assess relevant Liverpool City Council records,
- Identify potential contamination and areas of potential contamination from an interpretation of the currently available information,

2 Undertake a targeted Stage 2 – Detailed Site Investigation which includes the following:
- Take soil samples at five (5) sampling stations with 3-4 samples per station including duplicates,
- The soil samples will be obtained at two (3) different depths to ensure that a soil quality profile could be developed for future reference,
- All samples will be analysed for all chemicals including nutrients that are considered to be relevant to the previous use of the site.

3 Identify if a comprehensive Stage 2 - Detailed Site Investigation is warranted; and

4 Provide recommendations in relation to additional investigations or actions if any are considered necessary

1.2 STATUTORY REQUIREMENTS

There are no statutory requirements to undertake this PSI, however, Liverpool City Council (Council) believes that there was potential for the site to have been contaminated in the past due to the fact that as indicated in the Environmental Assessment Report (EAR) submitted to the Department of Planning and Environment (Department) as part of the development consent modification application No 4, the previous landlords may have undertaken cropping and grazing activities decades ago. In fact, the current landlord and as the historical aerial views since 2002 show that no such activities were undertaken in at least the last 15 years.

In any case, the proponent has determined that by undertaking this study it provides them and the relevant stakeholders' confidence and assurance of the current (pre-development) status of the site. The additional targeted Stage 2: environmental site assessment/investigation was also undertaken to provide all stakeholders with more confidence that the site is suitable for the proposed development.

Furthermore, despite the fact that not all the land will be used for the proposed stockpiling activities, it was considered appropriate to include most of the site in this investigation. **Figure 1-1** shows the area subject to this study.

The study has been carried out, generally, in accordance with the following relevant NSW EPA or NSW EPA recognised guidelines:

(a) Guidelines for Consultants Reporting on Contaminated Sites (OEH September 2011);
(b) Guidelines for the NSW Site Auditor Scheme (NSW EPA, June 1998);
(c) Contaminated Land Management Act 1997; and
(d) *NEPM Assessment of Site Contamination (NEPC, 1999) amended 2013*.

1.3 SUMMARY OF POTENTIAL ISSUES

Based on our extensive experience in environmental assessments and environmental risk assessments, we consider that the aspects outlined below should be assessed:

- Asbestos materials (on site);
- Radioactive material;
- Chemicals and fuels stored on site;
- Air emissions of pollutants;
- Surface water and/or groundwater pollution;
- Pesticide and herbicide usage;
- Electromagnetic fields;
- Nutrients in soil,
- Wastewater treatment system;
- Potable water sources; and
- Waste disposal.

1.4 SOIL SAMPLING REGIME

It was also agreed that a targeted soil sampling regime should be developed to undertake soil profiles/samples to test for any potential previous use-related contamination percolating into the soil layers. This report analyses the findings of a soil sampling program which was undertaken on 6 June 2017 to assess the extent of the potential contamination impact on the soil, if any.

The soil sampling regime was prepared by NICS on behalf of Epic, and was adopted to collect soil samples at the subject site where the proposed stockpiling will be undertaken. That regime should be referred to regarding the preliminary assessment of the soils, and the rationale behind the sampling undertaken as well as the rationale for selecting the range of relevant chemical parameters to be measured during this assessment. The regime is included in Section 9.

2. SITE IDENTIFICATION

2.1 SITE LOCATION

The site is located at 285 Adams Road which is also known to be 2470 Elizabeth Drive in the suburb of Luddenham and the Local Government area of Liverpool City Council in the State of New South Wales. Full details of the site location are provided in **Figures 2.1 and 2.2** as well as **Table 2.1**. More Specifically, **Figure 2.1** presents an aerial view of the site in the local context. **Figure 2.2** presents a closer aerial view of the site where site features can be easily identified including the dwellings and sheds that were the subject of a recent Development Application (DA) by the owner. In relation to the current land zoning of the site, full details are provided in this Section. A copy of the Site Survey is included in **Attachment 10**.

Figure 2-1: Aerial View of the Site in the Local Context

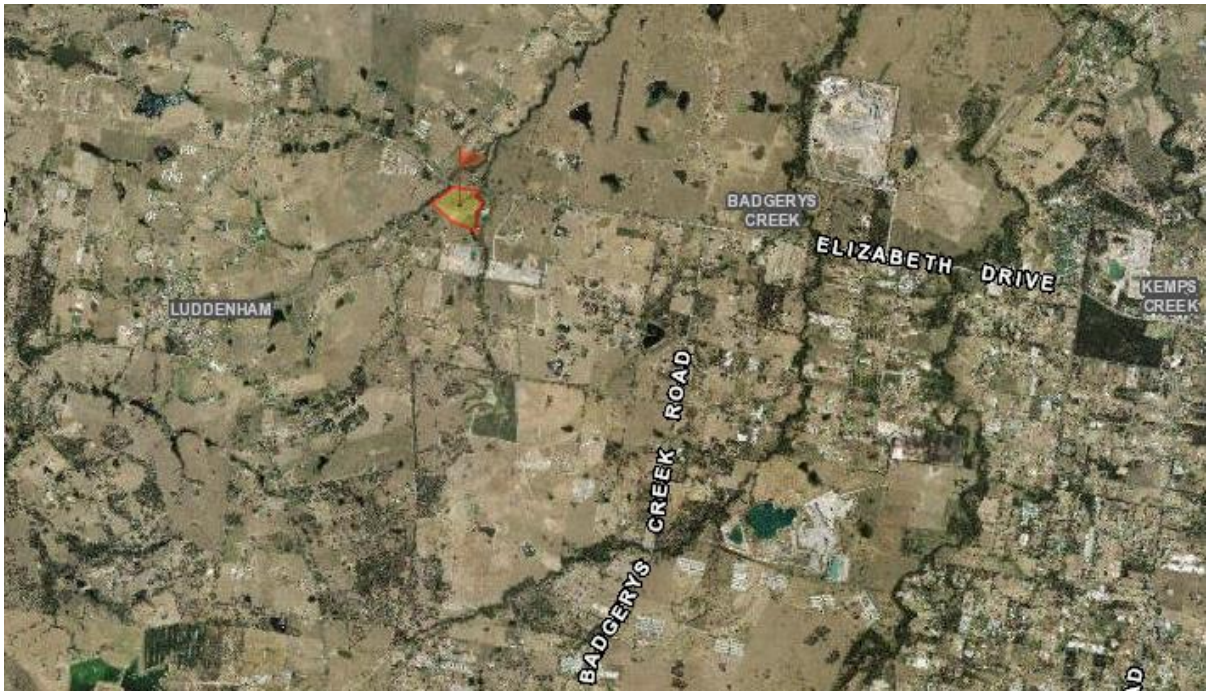


Figure 2-2: Aerial View of the Site – Closer View

2.2 SITE DESCRIPTION

The subject site is located in Luddenham, approximately 27 kilometres southwest of the city of Parramatta (direct line) or 34 kilometres by road, in the Parish of Bringelly, County of Cumberland and in the Liverpool Local Government Area. The subject site consists of one (1) Lot; Lot 281 DP 571171. The total area of the lot is approximately 11 hectares (or 110,000 m^2). The proposed development is located at the end of the existing access road/driveway where that Section of the land is relatively flat, sloping gently towards the East and South East.

Oaky Creek forms the boundary between this site and Lot 1 DP 838361 (Commonwealth owned land) and is an ephemeral drainage which only flows following significant rainfall events in the upper part of the catchment. An offline dam is located in the north-western corner of Lot 1 and a smaller storage dam occurs on the southern end. The southern boundary of the site is mainly with Lot 3 DP 623799 which is currently occupied by Epic Mining Pty Limited. This site is approved as extractive industries for the extraction of shale and clay. The subject site has three (3) relatively small retention dams, the two (2) larger of which are located away from the location of the proposed development.

A summary of site details are provided in **Table 2.1**.

Table 2-1: Summary of Site Details

Location	285 Adams Road or 2470 Elizabeth Drive, Luddenham - Lot 281 DP 571171
Total Area	Approximately 11 hectares or 110,000 m^2
Grid Reference (GDA94 – MGA56)	Middle of site = Easting: 288979 Northing: 6249826 Elevation: 65 m Street Address Location = Easting: 288775 Northing: 6249861 Elevation: 62 m
Local Government Area	Liverpool City Council
Existing Land Use	The environment of the site and surrounding properties is modified rural, consisting of grazing, poultry farms, crops in both hot house and open field environments and some dwellings
Current Zoning	RU1 – Primary Production
Proposed Development	Stockpiling activities associated with the Luddenham Clay and Shale Quarry

The site is relatively square in shape, and is surrounded by the following properties:

- Northern boundary with Elizabeth Drive,
- Western boundary mostly with Adams Road,
- Southern Boundary with Lot 3 DP623799, and
- Eastern boundary with Lot 1 DP838361.

2.3 SITE CONDITION AND SURROUNDING ENVIRONMENT

Land use in the surrounding area comprises a mix of agricultural, rural industrial and rural residential development set within a rural landscape. Prominent rural land uses in the surrounding area include a commercial social club called the Hubertus Country Club which is a commercial German club to the south west of the site. Elizabeth Drive is to the north of the site and Adams Road is to the west of the site. This Club was recently purchased by Blacktown Workers Club and its name has been changed to Workers Hubertus Country Club.

Rural residential development is the dominant land use in the surrounding area to the north, east and south. The nearest residences to the Project Site are more than 100 m to the southwest of the site (within Lot 1 DP623799) and 95 m to the north, beside the battle-axe handle accessed off Adams Road.

2.4 EXISTING DEVELOPMENT

Currently, there are no developments (only residential) on the site and no activities undertaken other than normal maintenance of existing grassed areas and the two dwellings. The main derelict dwelling (or dwelling 1) has extensive damage as well as being heavily infested with

termites as shown in the photographic section. The main dwelling became uninhabitable while it was still under the possession of the previous landlord. This is one of the main reasons for the new landlord's decision to demolish the unusable structures and install a new prefabricated steel shed. The intended use of the shed is mainly to store relevant machinery (i.e. Ride-on mowers, slasher mowers, whipper snippers, etc.…) some associated spare parts, and the undertaking of some minor maintenance and service works on these machines which will be used to maintain the site and the remaining dwelling. In relation to that approved development, it was considered that there would be no change in the existing use of the site but rather, there would be improvement to the presentation/aesthetics and safety of people living on site especially when the old rusty sheds and the partly damaged dwelling 1 are removed.

Another positive aspect is the reduction of covered areas by more than 400 m^2 after removing the old dwelling and sheds and the installation of the new shed as approved by Liverpool City Council (Council).

The subject site is surrounded to the east by Commonwealth owned land. This land is set aside for the use as a second Sydney airport. When the airport is developed on the adjoining land, it will greatly influence the future development of the subject site in a positive way.

However, for the proposed use which is stockpiling activities associated with the Luddenham quarry, it is consistent with the land zoning as outlined in this document.

One of the residential dwellings will continue to be occupied by a senior employee of Epic. He is also responsible for the security of the Epic controlled properties.

2.5 LAND ZONING

As previously stated the subject site is also known as Lot 281 DP 571171 which is approximately 11 Hectares in area and it is currently zoned as RU1 – Primary Production under Liverpool Local Environmental Plan 2008 (LLEP 2008). The objectives of that zone, the activities permitted with or without Consent and those that are prohibited are included below and referred to in Section 5 of this document.

Zone RU1 Primary Production

1 Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To ensure that development does not unreasonably increase the demand for public services or public facilities.
- To ensure that development does not hinder the development or operation of an airport on Commonwealth land in Badgery's Creek.
- To preserve bushland, wildlife corridors and natural habitat.

•

2 Permitted without consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations.

3 Permitted with consent

Agriculture; Airstrips; Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Hazardous storage establishments; Health consulting rooms; Helipads; Heliports; Home businesses; Home industries; Landscaping material supplies; Offensive storage establishments; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural industries; Rural supplies; Secondary dwellings; Veterinary hospitals; Water recreation structures.

4 Prohibited

Any development not specified in item 2 or 3.

Figure 2.4 presents the location of the site in the Liverpool City Council Area to provide the reviewer with a better understanding of its location in the Council context.

Figure 2.5 presents the location of the site in the RU1 Zone – Primary Production as depicted in zoning maps included the Liverpool Local Environmental Plan 2008.

Figure 2.6 presents a closer view of the location of the site in the RU1 Zone – Primary Production as depicted in zoning maps included the Liverpool Local Environmental Plan 2008.

Figure 2-3: Site Location in the Liverpool City Council Area

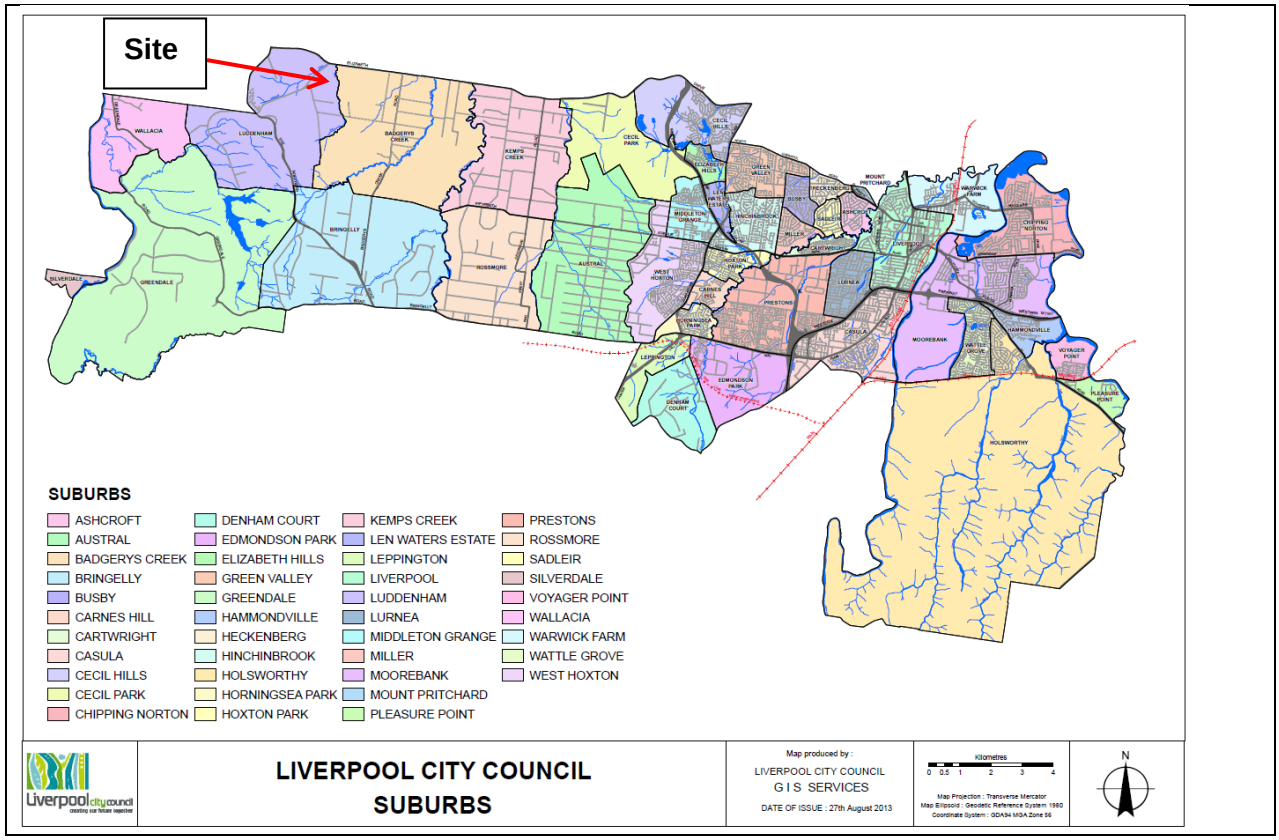


Figure 2-4: Site location in the RU1 Zone – Primary Production

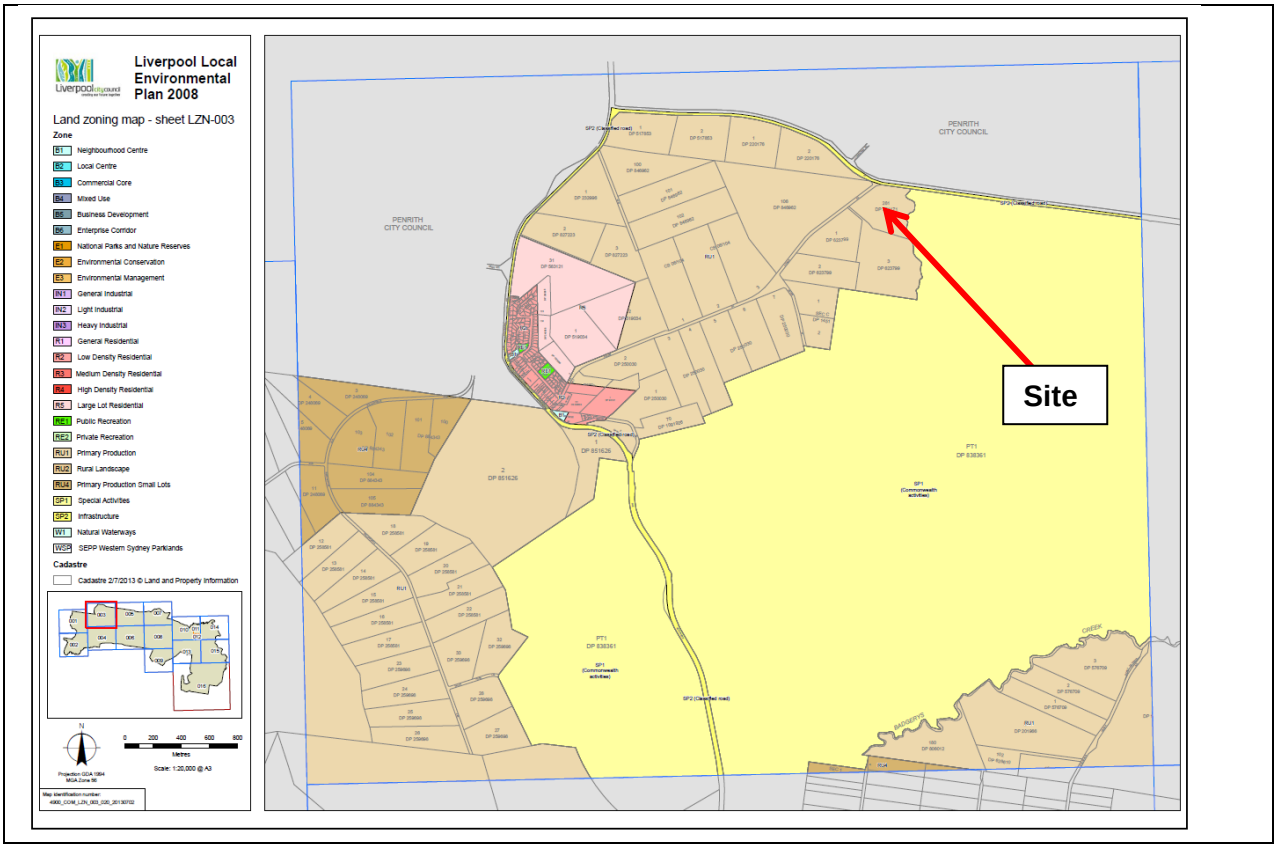
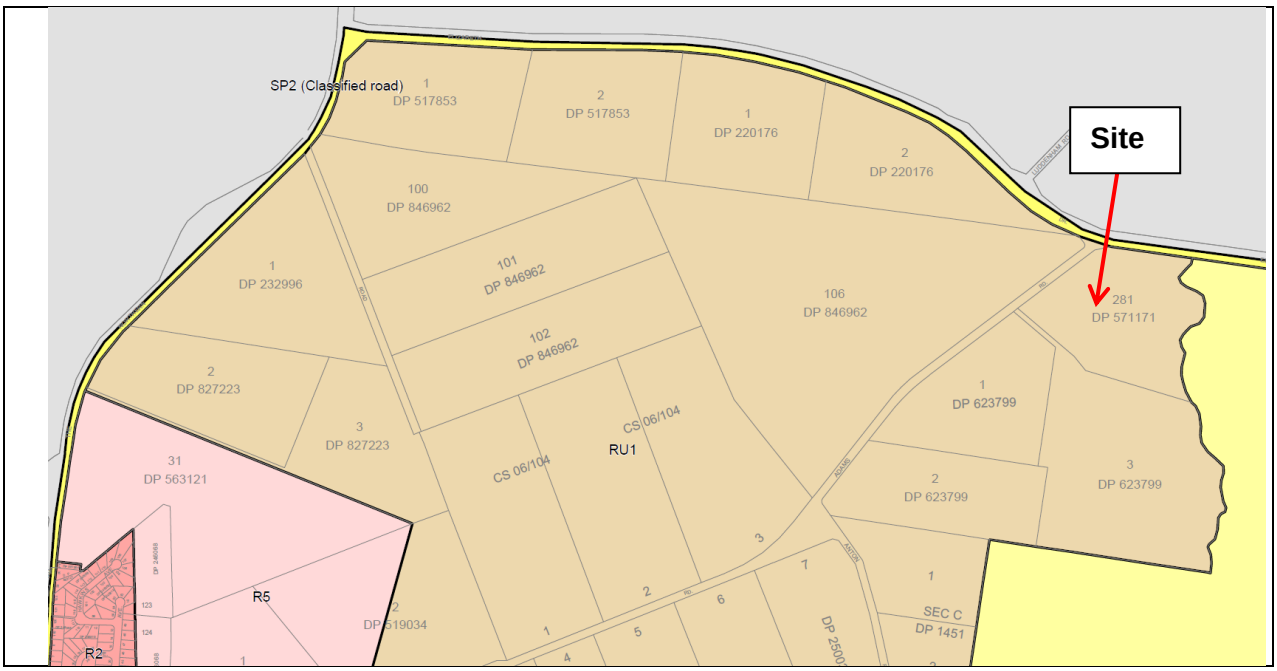


Figure 2-5: Site location in the RU1 Zone – Primary Production – Closer View



3. SITE SETTINGS

This section presents information on the soil characterisation, geology, hydrology, hydrogeology, topography and potential acid sulphate soil of the site.

3.1 LANDSCAPING AND OPEN SPACE

It appears that there is very little manmade landscaping on site and this is only found near dwelling 1 and comprising some small imported (now dead) plants such as Azaleas and Gardenias. All other landscaping around the site is what is left from the early days when the western settlers arrived in Australia and cleared most of the site except for two odd trees that are outside the proposed stockpiling footprint other than the small bushland near Oaky Creek.

The proposed Development will have no impact on the existing natural landscape of the site. The landlord and proponent will only remove the dead plants, maintain the land appropriately and protect the natural landscape in accordance with the requirements of Council, the NSW Office of Water and the Department of Environment and Heritage (National Parks and Wildlife Services).

3.2 GEOLOGICAL AND HYDROGEOLOGICAL SETTING

The surface of the area is covered by long grass and some weeds. Historical aerial views demonstrate the changes within the site in the last 15 years. The Photographical Section shows some of the existing natural and manmade features of the site.

It appears that there is very little manmade landscaping on site and this is only found near the dwelling, comprising of some small imported plants. All other landscaping around the site is a remnant from the early days when the western settlers arrived in Australia and cleared certain sections of the site, except the areas that are adjacent to and along Oaky Creek where a small area of bushland is still maintained by the previous and current owners, in addition to two (2) trees outside the stockpiling footprint.

3.3 REGIONAL AND LOCAL HYDROGEOLOGY

The dominant geological formations beneath the site are Bringelly Shale, the Luddenham Dyke and alluvium. Bringelly Shale is a Triassic geological unit mainly comprising claystone and siltstone, with some areas of sandstone. This unit underlies most of the site. Bringelly Shale is the top unit of the Wianamatta Group and is likely to be about 150 metres thick beneath the site, with overlying weathered material. Luddenham Dyke is a Jurassic groundmass of olivine basalt, analcite, augite, feldspar and magnetite. (Coffey Partners International 1990 and Bannerman & Hazelton 1990).

Geological maps of the area confirm that the site is located near the boundary of land underlain by the Bringelly Shale formation and alluvial fine-grained sand, silt and clay from the Quaternary Period. The Bringelly Shale formation typically comprises shale, laminate,

carbonaceous claystone, fine to medium grained lithic sandstone and rare coal that upon weathering forms clayey soils of moderate to high reactivity.

Subsurface conditions encountered within the sampling stations/boreholes/test pits are detailed in the borehole logs included in Attachment 5. Based on the subsurface conditions encountered in the investigation, it is evident that the soil profile throughout the site consists of topsoil SILT overlying medium plasticity Silty Clay soils with some Clayey SILT and CLAY at depth in these areas.

Groundwater was not encountered in any of the boreholes.

3.4 HYDROLOGY

Other than the man made farm dams which are shown in **Figure 3-1**, the nearest waterway to the site is Oaky Creek which drains into Cosgrove Creek and subsequently into South Creek. Based on our inspections, it appears that the dams have been relatively well maintained by the occupier and will continue to be so. Due to the fact that during the drilling at the site we did not intersect any groundwater or other water aquifers, we believe that groundwater will not be impacted on by the development as detailed above due to the depth of aquifers and groundwater in that area and the fact that the proposed development will not require excavations of the soil any deeper than 200 mm for levelling purposes only. On the contrary, the relevant portion of the site will be covered with a 300-700 mm layer of Virgin Excavated Natural Materials (VENM) and compacted appropriately to provide a non-impervious status of the area and, a stable and safe land for the use of heavy mobile machinery as part of the proposed stockpiling activities.

Based on the registered monitoring bores in the adjacent properties, groundwater is unlikely to be affected by sediments which are the only potential pollutant likely to occur from the proposed stockpiling of virgin materials excavated from the adjacent Luddenham quarry.

3.5 TOPOGRAPHY AND DRAINAGE

A comprehensive topographical survey was undertaken by Monaghan Surveyors Pty Ltd which is operated by very experienced Registered Land and Engineering Surveyors. The survey included all site features such as the dwellings and sheds proposed to be demolished, the utilities visible to the surveyor, the natural surface levels, natural surface contours and the trees in the vicinity of the dwellings and sheds. The survey included also the accurate dimensions of the site boundaries, the centreline of Oaky Creek and a 40 metres wide buffer strip along Oaky Creek.

3.5.1 Existing and Proposed Drainage

Based on the information obtained from the previous landlord, discussions with former tenants and the observations made during site inspections, we confirm that due to the rural nature of the site, the development area is not connected to Council's stormwater system or Sydney Water's sewer. The existing drainage system that has been used for over 50 years is comprised of an in-ground septic tank for each dwelling and several rainwater tanks for the collection of roof water which is used as potable water. Any water collected in the relatively small dams had been used for farming purposes when and if required.

Since one of the dwellings will be retained, there will be no changes to current drainage arrangements in relation to both roof water and sewer for that dwelling. In relation to the other dwelling, since the owners are proposing to install a new shed at approximately the same footprint as that dwelling, existing drainage arrangements will be maintained and connected to the sheds facilities, if required.

It is common knowledge that septic tanks do not pose any health risk, if operated and maintained properly. Most problems occur when septic tanks are overloaded. It is anticipated that the load on the septic tanks will be reduced due to the fact that the existing septic tanks were designed to cater for a large family (in the main dwelling to be demolished) whilst the proposed number of people that is likely to use the amenities will not exceed two on any one day. Hence, we believe that no changes are required to the current septic tanks arrangements.

Similarly for the roof water, the existing rainwater tanks are very large and capture rainwater from several roofs to cater for the families that resided in the two dwellings as well as some other workers that used to work on site. The demand for potable water will be reduced due to the smaller number of people that will occupy the site at any given time. Hence, no change to current rainwater/potable water is required.

Notwithstanding the above, Epic employees (4-5) will continue to use Epic's existing office and amenities located at the access road connecting Elizabeth Drive to the quarry rather than the facilities existing on this site since these facilities will not be open for use by any person other than current tenant of the habitable dwelling.

If these arrangements are to be changed, consultation with Council will be undertaken and relevant approvals will be obtained by the owners of that property.

3.6 VEGETATION

Based on the aerial views obtained from Google Earth, SixMaps, the recent site survey and site inspections, it appears that there are some trees along the Eastern Boundary of the site adjacent to Oaky Creek. The site is also covered with grass as the site has not been used for any purpose other than residential for decades. However, the section of site subject to this development is well established and no additional clearing of grass or other plants is required. There appears to be two (2) trees nearby. These will not be affected by the proposed development. Most of the site's stormwater runoff drains naturally either directly to the ephemeral Oaky Creek or to the existing three (3) relatively small retention dams. The natural surface water flow will be improved as a result of the proposed development by ensuring that all surface water from the relevant portion is diverted into a sediment pond to be installed at the most South Eastern corner of the site which is also the most downgradient location of the proposed development site.

3.7 ACID SULPHATE SOIL

Based on LLEP 2008, the site does not contain any acid sulphate soil (ASS) or potential acid sulfate soil (PASS).

This can also be confirmed by reviewing the Department of Land and Water Conservation (DLWC) acid sulfate soil risk map. This is now under the administration of the Office of Environment and Heritage (OEH).

No further assessment of acid sulfate soil or potential acid sulfate soil is required.

4. SITE HISTORY

The main objective of reviewing and presenting the site history is to ensure that the information, obtained through relevant Government and non-Government Agencies, which has been relied on has no gaps.

We have used the following in conducting our review of the site history:

- Review of Section 149 (2&5) planning certificate obtained from Liverpool City Council,
- Review of EPA records associated with both the Protection of the Environment Operations Act 1997 and the Contaminated Land Management Act 1997,
- Review of the Office of Environment and Heritage records, and
- Review of Liverpool City Council relevant documents through its website.

4.1 PAST CONSENTS

Based on the current owners' advice, the land had previous development consents associated with the construction of dwellings, sheds and associated structures. A development consent No DA 1035/2015 was confirmed by the both the current owner and Council. This consent was determined on 23 March 2015

4.2 AERIAL PHOTOGRAPHS

Aerial photographs obtained from Google Earth since 2002 are included in **Attachment 1**.

Following a review of these photos, it appears that the site has not changed much other than what appears to be the likely continuous maintenance of the site by the previous and current landlords including grass cutting which is common for these areas. However, due to the hard work of the owners and based on our observations during site inspections, the site including trees has been preserved in good conditions considering the natural disasters (i.e. fires, droughts) the area may have been subjected to in the last 15-20 years.

4.3 SECTION 149 (2&5) CERTIFICATE

Following our application to Liverpool City Council we have obtained copy of the Section 149 (2&5) Certificates for the subject land.

The planning certificates are included in **Attachment 2**.

A summary of the relevant issues is included below.

1 The land does not include or comprise a critical habitat,
2 The land is not within a conservation area,
3 The land does not have any items of environmental heritage situated within its boundaries,
4 The land is not affected by Sections 38 or 39 of the Coastal Protection Act 1979,

5 The land is not proclaimed to be in a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961,
6 The land is not affected by road widening or road realignment,
7 The land is not affected by policy, adopted by Council or other public authority, associated with hazard risk restrictions,
8 The land is not within the flood planning area, subject to flood planning controls or subject to flood related development controls,
9 The land is not identified as part of an acquisition plan by any public authority,
10 Council has no records that the land is biodiversity certified land,
11 Part of the subject land is identified as being bushfire prone land,
12 The land is not listed on the register maintained by the NSW Department of Fair Trading as containing loose-fill asbestos insulation,
13 Lands within Liverpool Council is excluded from the operation of the Native Vegetation Act 2003,
14 Council confirmed that under the Contaminated Land Management Act 1997 (the Act) (we believe it implies also that the Contaminated Land Management Amendment Act 2008 was also referenced), the following findings are provided:
    a. Council has no records that the land is significantly contaminated within the meaning of the Act,
    b. Council has no records that the land is subject of a management order within the meaning of the Act,
    c. Council has no records that the land is subject of an approved voluntary management proposal within the meaning of the Act,
    d. Council has no records that the land is subject of an ongoing maintenance order within the meaning of the Act,
    e. Council has no records that the land is subject of a site audit statement within the meaning of the Act.

4.4 NSW EPA RECORDS

The NSW Environment Protection Authority (EPA) maintains records that are publicly available on its website including the Public Register which is maintained under the Protection of the Environment Operations Act 1997 (POEO Act) and the Contaminated Land Records Register which is maintained under the Contaminated Land Management Act 1997 (CLM Act) and the Contaminated Land Management Amendment Act 2008.

4.4.1 POEO Act 1997 Records

A search of the POEO Act Public Register revealed that the land has not been the subject of any Notices or Environment Protection Licences (EPL) issued by the EPA. **Tables 4-1** and **4-2** include the results of the searches of the Public Register. The site is not the subject of any notices or EPLs.

Table 4-1: Results of search of the EPA's POEO Act Public Register - Notices

Number	Name	Location	Type	Status	Issued date
10812	BAIADA POULTRY PTY LIMITED	2907 THE NORTHERN ROAD, LUDDENHAM, NSW 2745	POEO licence	Issued	26-Mar-01
12863	EPIC MINING PTY LIMITED	275 Adams Road, LUDDENHAM, NSW 2745	POEO licence	Issued	05-Jun-09

Table 4-2: Results of search of the EPA's POEO Act Public Register - EPLs

Number	Name	Location	Type	Status	Issued date
3085771985	Allam Bros & Associates Pty Ltd	2859-2901 The Northern Rd, Luddenham	Penalty Notice	Issued	05-Aug-13
1524929	APPLIED ORGANICS PTY LTD		s.91 Clean Up Notice	Issued	23-Oct-14
1112136	EPIC MINING PTY LIMITED		s.58 Licence Variation	Issued	09-Mar-10
1502055	EPIC MINING PTY LIMITED		s.58 Licence Variation	Issued	28-Nov-11
1527921	EPIC MINING PTY LIMITED		s.58 Licence Variation	Issued	19-Feb-15
1532175	EPIC MINING PTY LIMITED		s.58 Licence Variation	Issued	17-Nov-15
3085781317	EPIC MINING PTY LIMITED		Penalty Notice	Withdrawn	30-Jan-17
3085781353	EPIC MINING PTY LIMITED		Penalty Notice	Issued	30-Jan-17
1538324	EPIC MINING PTY LIMITED		s.58 Licence Variation	Issued	08-Mar-17
1513234	SULAMAAN ALLAM	2859-2901 The Northern Rd, Luddenham	s.91 Clean Up Notice	Issued	23-Apr-13

Based on the above two tables, the site is not the subject of any notices or EPLs.

4.4.2 CLM Act 1997 Records

A search of the EPA CLM Act records revealed that the site has not been the subject of any notice issued by the EPA under the CLM Act. **Table 4-4** includes the results of this search. The site is not included.

Table 4-3: Results of search of the EPA's CLM Act Public Records

Home
Contaminated land

Based on the above searches, it is clearly evident that there are no statutory instruments issued by any Government Authority in relation to this site which demonstrate that the site is not contaminated.

4.5 NSW OEH RECORDS

We have also conducted a search through the Aboriginal Heritage Information Management System (AHIMS) managed by the NSW Office of Environment and Heritage (OEH). We conducted two searches; the first one using a buffer zone of 50 m and the second one using a buffer zone of 200 m.

It was considered appropriate to search the AHIMS to ensure that the land does not contain any Aboriginal items or sites of cultural heritage values.

The results of our search are included in **Attachment 3**.

Further discussions with the relevant section of the OEH revealed that none of the sites identified in the search are within the subject site but rather outside. This was later on confirmed in writing by the OEH as part of the formal consultation required as part of the planning process.

4.6 LIVERPOOL CITY COUNCIL RECORDS

As part of this report, it was considered appropriate to review whether there are any Heritage-related (European or Aboriginal) issues associated with the site. Based on Schedule 5 of Liverpool City Council's LEP titled *"Environmental Heritage"* which included *Part 1 Heritage items, Part 2 Heritage conservation areas* and *Part 3 archaeological sites*, it is clearly evident that there are no sites or objects of heritage values found or identified within or adjacent to the site. Hence, the following findings were noted:

- *No sites or objects of heritage values were found or identified within or adjacent to the site,*
- *No sites or objects of archaeological values were found or identified within or adjacent to the site.*

Attachment 4 includes a list of all heritage items listed in Schedule 5 of Liverpool City Council's LEP titled *"Environmental Heritage".* The proposed activities will have no impact on these items.

4.7 INTERNET SEARCH

We undertook a comprehensive internet search to determine whether there have been any matters associated with the site or in the vicinity of the site that may have had the potential of any adverse environmental impact on the site. No matters were found.

5. SITE CONDITIONS AND SURROUNDING ENVIRONMENT

5.1 LOCAL TOPOGRAPHY

Based on the Aerial views obtained from Google Earth and SixMaps in addition to the topographical survey previously mentioned, the proposed development area within the site is reasonably flat except for the farm dam. A copy of the survey was included in the EIS.

5.2 SITE INSPECTIONS

During the preparation of the EIS and this PSI, several site inspections were undertaken to ensure that any assessment undertaken accurately reflected the current status of the site and the surrounding environment. During our most recent inspection on 6 June 2017, we also walked along both sides of Elizabeth Drive as well as Adams Road for approximately 500 m in the vicinity of the subject land to ensure that several neighbouring properties located in the vicinity of the site were briefly visited. This is extremely important in some cases where some unapproved activities may cause pollution of waters or excessive air emissions which may have the potential to migrate to neighbouring properties including the subject site.

The site inspections confirmed also the previously stated surrounding environment of being mainly of a rural residential nature with some minor agricultural activities and a few cows, sheep and goats here and there.

The driveway is mainly made of compacted road base, asphalt and sandstone. This driveway is regularly maintained since it is being used constantly by the current residents/tenants. No major irregularities exist within the driveway as a small sedan car as well as a medium size truck can use the driveway comfortably.

5.3 PHOTOGRAPHIC SECTION

Several photos were taken during the site inspections to provide the reader with a better understanding of some of the site features. These photos are included below.








Photo 1: View of the Site looking West

Photo 2: View of the Site looking South

Photo 3: View of the Site Looking East

Photo 4: View of the Site Looking North

5.4 POTENTIAL CONTAMINATION ISSUES

In this section, we present the potential contamination issues as found on the inspection days especially during the last inspection of 6 June 2017 during the soil sampling exercise.

5.4.1 Asbestos Materials

The presence of asbestos containing materials, as defined by the EPA within the legislation and the waste classification guidelines, within the existing buildings and structures is likely based on the inspections of the existing dwellings. However, these dwellings are outside the proposed stockpiling footprint and they are the responsibility of the landlord to deal with rather than Epic Mining since they are outside the area subject to this investigation. Furthermore, no asbestos containing materials were found within the area subject to this PSI.

5.4.2 Radioactive Materials

It was not expected to find any radioactive materials on site and none were found.

5.4.3 Chemicals and Fuels Stored on Site

There is always a potential for fuel and oil spills to occur during transfer of these materials from large drums into vehicles or small containers. During our inspections we could not find any containers with oil, fuel or chemicals on the subject site. In addition, there was no evidence of spills within the inspected areas.

5.4.4 Air Emissions of Pollutants

Due to the fact that only minor grass maintenance activities are currently undertaken on site such slashing and grass cutting, there are no air emissions of pollutants that may result in any impact on human health or the environment.

5.4.5 Surface Water and Groundwater Pollution

Since there has been no previous commercial or industrial activities previously undertaken on site, we were not expecting to find any surface water or groundwater pollution. There was no evidence of surface water or land pollution within the inspected areas. Activities such as cropping and grazing are unlikely to have caused any pollution of groundwater. However, cropping and grazing may have the potential to contaminate land to a certain level and depth depending of the extent of the use of fertilizers on site during these activities.

In relation to the potential impact of previous activities on groundwater, we believe that due to the limited mainly rural residential activities at the site and the groundwater standing water level being very deep relative to the activities that will were undertaken above ground, the groundwater is unlikely to have been affected.

In any case, following a review of the groundwater bores registered and monitored by the NSW Department of Primary Industry - Office of Water in the vicinity of the site (Greater Sydney Region – Hawkesbury River Basin, the closest registered and monitored groundwater bore is within the adjacent Luddenham Quarry site Quarrying activities has been undertaken for about six (6) years and these bores are less than 10 years old. Hence, the activities previously undertaken on site would not have had any impact or potential impact on any groundwater monitoring bores or the groundwater table.

5.4.6 Pesticide and Herbicide usage

Due to the fact that the dwelling and surrounding areas have been used by previous and current occupiers, and their families for over 50 years only domestic biodegradable grades of pesticides and herbicides were likely to have been used on site but the use is most likely to be limited to the vicinity of the dwellings and sheds. It was clearly evident that the growth of weeds has been well controlled.

5.4.7 Electromagnetic Fields

None was found on this site.

5.4.8 Wastewater Treatment System

No wastewater is generated on site and no wastewater treatment system is installed. Only domestic generated sewerage is generated at the dwelling currently occupied by an employee of Epic, This dwelling has its own septic tank which has been operating for over 50 years without any problems. In any case, this dwelling is outside the proposed stockpiling footprint and not within the responsibility of Epic but rather the landlord.

5.4.9 Potable Water Sources

Due to the fact that the site is not connected to the potable water grid, there will be a need for the proponent's employees to continue on using the potable water provided in Epic's site office and amenities located at the main access road. However, in an emergency the employees could be provided with access to the potable water derived from the rainwater tanks which the current dwelling occupiers are and have been using for decades this water as their only source of potable water.

5.4.10 Waste Disposal

No waste is currently generated or handled within the area subject to this investigation.

No evidence of other waste materials that are likely to cause contamination was found on site.

No evidence of contamination due to waste materials was found on site.

6. CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments and provides the framework for identifying if and how the site became contaminated and how potential receptors may be exposed to contamination either in the present or in the future. The CSM can be a useful tool for informing discussions with stakeholders regarding the investigation and management of potential and known contamination impacts.

Despite the fact that no significant contamination (other than possible nutrients due to cropping and grazing activities) was found on the site due to the limited rural residential activities occurring on site over many years, it was considered appropriate to prepare a Conceptual Site Model (CSM) in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) as amended in 2013. The CSM is included in T**able 6-1**.

Table 6-1: Conceptual Site Model

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Potentially impacted Media	Contamination of Potential Concern	Potential Receptors		Exposure Pathways		Risk of Contamination
				Human	Environment	Human	Environment	
Asbestos Sheets (outside the proposed stockpiling footprint)	Breaking, cutting, drilling, etc.	Soil	Asbestos	Workers on site Owners Visitors	Soil	Dermal contact, Inhalation of dust fibre Ingestion	Soil Surface water	Low, if managed by professionals
Oil and fuel	Spills/leaks	Soil Surface water Groundwater	Hydrocarbons VOCs	Workers on site Owners Visitors	Soil Surface water Groundwater	Dermal contact, Inhalation of VOCs and hydrocarbon fumes Ingestion	Soil Surface water Groundwater	Low due to the fact that no such materials will be stored within the proposed area

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Potentially impacted Media	Contamination of Potential Concern	Potential Receptors		Exposure Pathways		Risk of Contamination
				Human	Environment	Human	Environment	
Fertilisers	Spreading	Soil Surface water Groundwater	Nutrients	Workers on site Owners	Soil Surface water Groundwater	Dermal contact	Soil Surface water Groundwater	Very low due to the non-use for over 15 years
Pesticides	Spraying	Soil Surface water Groundwater	Pesticides	Workers on site Owners	Soil Surface water Groundwater	Dermal contact	Soil Surface water Groundwater	Very low due to the non-use for over 15 years and the limited household biodegradable grade use in the proximity of the dwellings

Based on the results of the above model, it can be concluded that the risk of contamination is low.

7. GAPS IN INFORMATION

Based on the information available during this investigation, we were unable to locate stormwater and sewer plans. It is believed that the proposed site is not connected to a publicly available stormwater or sewer systems. In any case, sewerage management is not an issue for Epic since stockpiling activities do not generate sewerage. All Epic employees will continue to use Epic's main amenities adjacent to the site office.

8. AREAS OF ENVIRONMENTAL CONCERNS AND POTENTIAL CONTAMINANTS OF CONCERN

Based on the information presented in this document, it is clearly evident that fertilisers that may have been used for cropping purposes more than 15 years ago, are considered to be the most potentially contaminating materials of concern on the site, however, these tend to replenish nutrients taken from the soil through crop growth. Pesticides were also considered in this assessment due to the potential for some people to use certain pesticides incorrectly or to use non-approved pesticides.

Other areas of concern are the potential for any uncontained spills of chemicals to leach into the soil, waterways and eventually groundwater. It is not proposed to store any hydrocarbon products (oil, grease, fuel) within the proposed area. However, if any limited quantities are stored for emergency repairs, these chemicals should be stored appropriately, preferably within bunded, isolated and enclosed areas to ensure that in the case of any spills, these chemicals cannot migrate outside the storage area. However, in case that the chemicals are not stored properly or in case of an accident, mitigation measures should be installed and maintained to ensure that any spills of chemicals are promptly contained and cleaned up before reaching soil or waterways.

9. SAMPLING AND ANALYSIS REGIME AND SAMPLING METHODOLOGY

9.1 GENERAL

A soil assessment was necessary in order to assess the nature and extent of any potential contamination as a result of the previous cropping and grazing activities as well as the use of fertilisers as part of these activities. The purpose of this section is to discuss the details of the assessment including the sampling and analysis plan, and sampling methodology.

9.1.1 Identify Key Factors

The key factors are:

To determine the extent of contamination, and
To establish benchmark/baseline levels of contaminants identified on site.

9.1.2 Develop a Decision Rule

The main decision rule adopted in this assessment involved:

Comparing soil sampling results to health investigation or screening levels (Health Investigation Levels (HILs) and Health Screening Levels (HSLs)) to determine whether the soil on-site is contaminated or not.

9.2 SAMPLING RATIONALE

The soil sampling design was carried out in accordance with the EPA NSW *Sampling Design Guideline – Contaminated Sites (EPA September 1995) and the NEPC NEPM 1999 (Amended 2013)* using grid sampling as far as is practical, reasonable and relevant for this targeted assessment. Since this is a targeted assessment to mainly determine the extent of contamination as a result mostly of the use of fertilisers on site rather than a generic contamination assessment, some deviations from the generic guidelines' requirements were necessary to ensure that identification of the extent and accurate locations of contamination were as precisely determined as possible. This is strengthened by the fact that the contaminants are generally known to all prior to any assessment.

It was decided that five (5) sampling stations within and around the perimeter of the proposed location of the proposed stockpiling be established to ensure that the potentially contaminated areas could be identified with very high confidence (as per the agreed regime). This was determined since the majority of the development will be undertaken on a semi impervious to impervious pad which makes any seepage of chemicals into the subsoil near impossible.

The sampling rationale will ensure that at the completion of the development a comparison could be undertaken between the pre-development period taken as the baseline and post development to determine whether the development has increased or decreased the pre-development contaminants levels or remain unchanged.

Under normal circumstances and where the underground status of the site is well known based on historical geotechnical assessments and/or approved drawings, a drilling rig would be used on site by an accredited drilling company. The drilling stations (boreholes) on site would have been prepared and completed in a very short time. However, due to the fact that the area subject to the assessment is in a rural area and with many unknown parameters, it was considered that the best approach to establishing the sampling stations was to use manually operated and petrol driven digging/drilling equipment and tools to prevent any accidental punctures of existing utilities buried in that area. Then a careful digging using an excavator will be used to expose a greater area of the sampling stations.

Figure 9-2 shows all the equipment and tools used to establish the sampling stations. **Figure 9-3** shows all equipment used in the decontamination of the equipment and tools used to establish the sampling stations to obtain relevant samples. More details are included below.

9.2.1 Sampling Locations and Depths

The locations of sampling stations used for this assessment are displayed in **Figure 9-1.** Coordinates of sampling stations are included in **Table 9-1**. These locations were strategically selected to cover most of the proposed stockpiling footprint.

Table 9-1: Coordinates of sampling Stations

Sampling Station ID	Latitude	Longitude	Elevation m	Zone
EPIC1	-33.872338	150.719717	60	56
EPIC2	-33.870487	150.720217	58	56
EPIC3	-33.869780	150.718823	62	56
EPIC4	-33.870292	150.717663	63	56
EPIC5	-33.870292	150.717663	64	56

Note: #Zone 56: GDA94 - MGA56

Figure 9-1: Location of Sampling Stations

Location of Sampling Stations

Figure 9-2: Tools used to establish the Sampling Stations

Manually operated tools

Petrol driven auger

Excavator

Figure 9-3: Equipment used to decontaminate Tools

Details of all soil samples are included in **Table 9-2**.

Table 9-2: Details of soil samples taken on 6 June 2017

Sampling Station ID	Sample Name	Time	Depth	Comments
EPIC1	EPICSS1A EPICSS1B EPICSS1C EPICSS1CC*****	8.20 am 8.30 am 9.00 am 9.01 am	0-0.15m 0.30m 0.70m 0.70m	PID=0.0 ppm
EPIC2	EPICSS2A EPICSS2AA***** EPICSS2B EPICSS2C	10.51 am 10.52 a 10.58 am 11.04 am	0-0.15m 0-0.15m 0.30m 0.70m	PID=0.0 ppm
EPIC3	EPICSS3A EPICSS3B EPICSS3BB***** EPICSS3C	10.31 am 10.33 am 10.34 am 10.39 am	0-0.15m 0.30m 0.30m 0.65m	PID=0.0 ppm
EPIC4	EPICSS4A EPICSS4B EPICSS4C	10.13 am 10.16 am 10.20 am	0-0.15m 0.30m 0.70m	PID=0.0 ppm
EPIC5	EPICSS5A EPICSS5B EPICSS5C	10.01 am 10.04 am 10.08 am	0-0.15m 0.30m 0.70m	PID=0.0 ppm

NOTE: *****Duplicates

9.2.2 Drilling and Sampling Procedure

Each borehole/sampling station was to be drilled to at least 0.6-0.7m with samples generally taken at 0.1m, 0.3m and at the deepest drilled point. The 0.3m sample depth was regarded as the most representative of localised conditions for analysis as this depth is sufficiently below the surface to be representative of expected soil conditions. However, due to what appeared to be virgin clay soil below the 0.3 m depths and included in **Table 9-2**, drilling below these depths was relatively difficult despite the fact that all tools used were new including the petrol driven auger, an excavator was considered to be a more efficient way of excavating deeper to obtain samples below 0.3 m. Sampling details including depths, duplicates, description of soil layers, presence or absence of odours, colour and texture of soil samples and any evidence of other materials observed also, etc.… are presented in **Table 9-3.** Borehole details with that information are included in **Attachment 5.**

All samples were taken using a clean trowel which transferred the samples into new 250ml glass sample bottles supplied by the NATA accredited ALS laboratories, Smithfield. After each sample was taken, labelled and sealed with relevant details noted including Project/Client Name date, time, Sample Station number, sample ID, sampler name, odour presence or absence, etc., it was transferred into an esky with ice packs to keep the samples cool. The esky was placed in a shaded area to ensure that the heat did not have any significant impact on the results. Between each sample the trowel was thoroughly cleaned in fresh water and again in distilled water with Decon 90 (a phosphate free detergent) using a spray bottle then dipping the cleaned trowel in a bucket of distilled water and Decon 90. The trowel was then dried with a clean J cloth. This procedure ensured that no cross contamination occurred between samples. Strong heavy duty and oil resistant industrial gloves were also used during this operation and these were also thoroughly cleaned between samples. This procedure was also undertaken for all equipment used in the preparation of the sampling stations when approaching the required sampling depth to

prevent cross contamination between samples at different depth within the same sampling station (borehole).

It was not considered necessary to take control samples due to the fact that all surrounding areas/properties have been used for similar activities. Therefore, control samples will not reflect the intended purpose of a control sample.

Following the completion of sampling, the samples were transported to the NATA accredited ALS laboratories at 277 Woodpark Road, Smithfield by the sampler. As per the required regime Chain of Custody (CoC) forms were also completed and the samples remained intact during transport to the lab. All samples, completed CoC forms and relevant documents were handed to a laboratory coordinator as indicated in the CoC forms (**Attachment 9**).

Photographs 1 and **2** show an example of the sampling stations (boreholes) established for soil sampling. Photographs of all sampling stations are included in **Attachment 6**.

Photograph 1: Sampling station/borehole 1.

Photograph 2: Sampling station/borehole 2.

9.3 FIELD OBSERVATIONS

The majority of the site consisted of sandy or silty soil, mostly fairly dry with greyish soil/aggregate near the surface and sandy at 0.3m and more orange almost terracotta coloured as well as red and yellow at deeper levels. In some sampling stations, most soils were silt and clay and in others clay was orange, brownish, red, yellow, terracotta. Field observations are summarised in **Table 9-3**. Full details are included in the boreholes (sampling stations) logs in **Attachment 6**.

Table 9-3: Field Observations

Sampling Station ID	Sample Name	Odour	Other Observations
EPIC1	EPICSS1A	Earthy odour	Loose soil - silt
	EPICSS1B	Earthy odour	Clay – grey
	EPICSS1C	Earthy odour	Yellow brown clay
	EPICSS1CC*****	Earthy odour	Yellow brown clay
EPIC2	EPICSS2A	Earthy odour	Loose soil
	EPICSS2AA*****	Earthy odour	Loose soil - silt
	EPICSS2B	Earthy odour	Clay – grey
	EPICSS2C	Earthy odour	Clay - yellow and grey
EPIC3	EPICSS3A	Earthy odour	Loose soil - silt
	EPICSS3B	Earthy odour	Clay - grey
	EPICSS3BB*****	Earthy odour	Clay – grey
	EPICSS3C	Earthy odour	Clay - red and grey
EPIC4	EPICSS4A	Earthy odour	Loose soil - silt
	EPICSS4B	Earthy odour	Clay – grey
	EPICSS4C	Earthy odour	Clay - red and grey
EPIC5	EPICSS5A	Earthy odour	Loose soil - silt
	EPICSS5B	Earthy odour	Clay – Red and grey
	EPICSS5C	Earthy odour	Clay - red and yellow

SS means Soil Sample

9.4 Analytical Testing Methods

The soil samples were analysed by ALS laboratories. ALS laboratories are NATA accredited and carry out analytical methods based on well-established, internationally-recognised procedures such as those published by the US EPA, the American Public Health Association (APHA), Australian Standards and NEPM (2013) guidelines.

The methods used are described in the quality control reports provided by ALS laboratories and included in **Attachment 8**.

9.5 SOIL SAMPLING METHODS

9.5.1 Sampling Containers

New glass sampling containers were used for all soil samples.

ALS Laboratories provided the following containers:

- 250 mL wide mouth glass jar with orange label for each soil sample.

9.5.2 Sampling Equipment and Methods

Soil samples were collected by using hand and petrol driven augers, a stainless steel trowel, a large thin shovel and a post-hole pincer. The sampler placed the soil into a clean new 250 mL glass jar (supplied by ALS Laboratories for the intended sampling, testing and analysis). The soil was packed tightly into the container so no air space or voids were left. All jars were marked with the information mentioned above. The sampling jars were opened by the laboratory technician for testing.

9.5.3 Equipment Decontamination Procedures

Between each sampling process all the sampling equipment was decontaminated in order to avoid cross contamination. A decontaminating solution of 2%-5% Decon 90 diluted in distilled water was prepared. Decontamination of the sampling equipment was obtained by scrubbing the utensils with decontaminating solution (Decon 90) and rinsing with distilled/ deionised water. The utensils were also dried with single-use J cloths between samples.

9.5.4 Sample Handling Procedures

Immediately after collection, all soil samples were placed in an esky containing ice to keep cool. At the end of the day's sampling, more ice was placed in the esky to ensure that the samples remained at low temperatures. All samples were transported in this condition directly to ALS Laboratories at 277 Woodpark Road, Smithfield.

The Chain of Custody (CoC) forms were also completed with relevant information and submitted to the lab along with the samples.

The chosen laboratory performing the sample analyses is accredited by the National Association of Testing Authorities (NATA) for all of the required tests. Methods used for analyses are provided in **Attachment 8**.

9.5.5 Sample Preservation Methods

The soil samples were placed into a chilled esky and after sampling they were delivered to the laboratory. A laboratory coordinator noted on the chain of custody form that the samples were received in a satisfactory condition in relation to transport time and chilled condition.

No chemical preservatives were added to the soil samples except what was included by ALS during container preparation.

Samples were analysed within acceptable holding times. Refer to **Attachment 8** (QCI).

9.5.6 Field Screening

Field screening using a Photoionisation Detector (PID) was undertaken to assess the potential presence of volatile organic compounds (VOCs) in soil. This method allows the investigators to define the focus of the investigation; however, the results obtained by using a PID cannot be used to demonstrate compliance with the regulatory policies and guidelines.

This method is only a qualitative method and it has been used in order to identify any additional potentially contaminated areas.

All soil sampling stations were tested with the PID. All results for sampling stations were 0.0 ppm using the PID Meter **Bside–EET100** Air Quality Monitor.

10. SOIL ANALYTICAL RESULTS

It was decided to analyse mainly for specific petroleum hydrocarbons, nutrients and pesticides, and related parameters based on the potential contamination from the previous activities. In this case, no other analysis was necessary. The above analysis applies to all soil samples. All results including duplicates, surrogates etc., are found in **Attachment 7**.

10.1 SOIL SAMPLING

For the soil sampling parameters the analysis outlined below was undertaken.

10.1.1 Hydrocarbons and Related Parameters

The results indicated that no hydrocarbon products were present in any of the sampling stations. All results were below the laboratories LORs.

10.1.2 Nutrients and Related Parameters

In terms of soil sampling depth for nutrients related parameters, different laboratories and companies may recommend different sampling depths as being representative, with zero to 0.3 m fairly common and sometimes 0.3 to 0.60 as well. However, McKenzie prefers to see soil sampling done in three increments, including 0 to 0.15 m, 0.15 m to 0.3 m and 0.3 to 0.6 m. "*Taking samples from these increments gives producers the best picture of what is in their field for nutrient planning*," says McKenzie.

"By taking a sample in the zero to 0.15 m layer where the topsoil or A horizon is located, and the 0.15 m to 0.3 m mineral layer below, you get a better idea of what is in each of those two levels." Both phosphorus (P) and potassium (K) tend to be in that zero to 0.15 m depth, and a more accurate measure will result by taking a sample representative of that topsoil layer. For nitrogen (N) and sulphur (S), particularly in wetter years, there tends to be more S at deeper levels, especially in the Brown and Dark Brown soil zones. Therefore, sampling at 0.3 to 0.6 m gives a better analysis of N and S at that level, as well as a measure electro-conductivity for salt levels.

Although McKenzie recommends sampling at three depth increments, he notes that often industry dealers prefer to sample at 0 to 0.3 m. If they are using automatic soil samplers, these machines are designed to only take samples at one or two depths, not three. Sampling at 0 to 0.3 m is better than nothing, but it is far better to do further depth sampling. Sampling the 0.3 to 0.6 m can make a huge difference in the amount of N and S fertilizer being applied. With P and K, it is most important to know what is in the top 0.15 m. Therefore, testing for P and K at the 0 to 0.15 m depths on most fields is recommended, except for recently manured fields.

Based on the results of all samples, it is clearly evident that the soil contained different levels of various nutrients at different depths. These values give extremely useful data to the proponent especially that the proposed activities are unlikely to generate some similar chemicals as part of the stockpiling of virgin materials excavated from the Luddenham quarry and stored on the proposed development site. This will be used to demonstrate whether the proposed development will have any negative, neutral or positive impact on the soil and

subsoil at the end of the development. Therefore, appropriate Remedial Action Plans can then be prepared, if required.

10.1.3 Pesticides

Based on the results, it appears that no pesticides were found in any of the samples. This demonstrates that pesticides have not been used in this area for many years and confirms our statements that cropping and grazing have not been undertaken for over 15 years and therefore, there was no need to use pesticides. Accordingly, all results for both Organochlorine and Organophosphorus Pesticides (OC&OP) were below their respective LORs.

10.1.4 Investigation Areas

The field observations suggested that there were no hot spots per se but rather all the sampling stations presented very consistent soil characteristics at similar depths.

The degree of contamination at this site is considered to be very consistent at similar depths with normal cropping and the use of fertilisers to accelerate the healthy growth of crops, with very small deviations that are within the analysis tolerances.

10.2 WATER SAMPLING

The assessment was initially meant to focus on soil sampling with the option to take water samples, if found in the vicinity of the investigation area or at the sampling stations. However, during the soil sampling session, it was noticed that none of the established sampling stations contained any water. Hence, it was determined that water sampling was not necessary or warranted.

11. FIELD QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Analytical data reported by ALS was judged to have met the essential criteria for data quality for analysis of the samples. The data assessment examined laboratory results, COC documentation, and laboratory QA/QC. The following sections describe the results of the QA/QC implemented in this assessment.

Quality Assurance and Quality Control applied to this project were in accordance with AS 4482.1–2005 in regard to the followings:

Precision – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.

Accuracy – measures the bias in a measurement system. The accuracy of the laboratory data that was generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.

Representativeness – expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the potentially affected site, and by using an adequate number of sample locations to characterise the potentially affected site to the required accuracy.

Comparability – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods as required by NATA.

Completeness – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

The frequency of sample and data quality objectives in accordance with AS 4482.1–2005 would apply and will be satisfactorily achieved with an acceptable explanation from the laboratory.

In addition, quality assurance procedures identified in the US EPA Soil Gas Sampling procedure Number SESDPROC-307-R3 has been adhered to as far as practicable.

11.1 DECONTAMINATION PROCEDURES

For the soil samples, the equipment used was decontaminated on-site as per Section 4. The gloves were decontaminated as well.

11.2 BOREHOLE LOGS

All field borehole logs and field observations are provided in **Attachment 5**.

11.3 CHAIN OF CUSTODY

Upon sample arrival at the laboratory, a technician/coordinator noted on the "*chain of custody*" (CoC) form that the samples were received in a satisfactory condition in relation to transport time and chilled condition.

The following information was recorded on the CoC forms.

Client identification (i.e. EPIC, NICS),
Client address,
Project manager and contact details,
Sampler Name/ID,
Project ID,
Site location,
Sample ID,
Date and time,
Specific comments,
Method of transport, date and time;
Received by details, date and time; and
Laboratory technician's comments.

Copies of the completed Chain of Custody (CoC) Forms are included in **Attachment 9**.

11.4 LABORATORY QA/QC

The NATA accredited laboratories used in this investigation followed in-house QA/QC procedures. This information is provided in **Attachment 8**.

11.5 QA/QC DATA EVALUATION

Data evaluation of QA/QC for soil sampling is summarised in **Table 11-1** provided below.

Table 11-1: Soil QA/QC Data Evaluation against QCI

Data Quality Objectives	Frequency	Achieved?	Data Quality Indicator	Achieved?
Precision				
Laboratory Duplicates (DUP)	<10% of total number of samples	Yes – provided in laboratory Quality Control Reports (Attachment 8)	Within DUP recovery limits for each compound/group	Yes – provided in laboratory Quality Control Reports (Attachment 8) (No Duplicate outliers occurred)
Accuracy				
Blind field duplicates	17% of total number of samples	Yes – 3 duplicate samples were analysed	<50% RPD	Yes – provided in laboratory Quality Control Reports (Attachment 8) (No Duplicate outliers occurred)
Laboratory Control Spikes (LCS)	<5% of total number of samples	Yes – provided in laboratory Quality Control Reports (Attachment 8)	Within LCS recovery limits for each compound / group	Yes. Details provided in laboratory Quality Control Reports (Attachment 8)
Matrix Spikes (MS)	<5% of total number of samples	Yes – provided in laboratory Quality Control Reports (Attachment 8)	Within MS recovery limits for each compound / group	Yes - Details provided in laboratory Quality Control Reports (Attachment 8)
Trip Blanks (TB)	1 per cooler	N/A	Below limits of reporting (LOR)	N/A
Trip Spikes (TS)	1 per cooler	N/A	Within acceptable recovery limits of 70 to 130%	N/A
Representativeness				
Method Blanks (MB)	<5% of total number of samples	Yes – provided in laboratory Quality Control Reports (Attachment 8)	Variance between sample results and LOR	Yes – provided in laboratory Quality Control Reports (Attachment 8)
Sampling appropriate for media and analytes	All Samples	Yes	No errors in selection of media and analytes	Yes
Samples collected and analysed within holding times	All Samples	Yes – provided in laboratory Quality Control and analysis reports (Attachment 8)	14 days for VOC	Yes – provided in laboratory Quality Control and analysis reports (Attachment 8)
Comparability				
Standard operating procedures for sample collection and handling	All Samples	Yes – standard operating procedures were followed.	No errors in compliance with procedures	Yes – standard operating procedures were followed
Standard analytical methods used for all analytes	All Samples	Yes – standard analytical methods were used	No errors in selection of analytical methods	Yes – standard analytical methods were used
Consistent field conditions,	All Samples	Yes	No variations reported	Yes

Data Quality Objectives	Frequency	Achieved?	Data Quality Indicator	Achieved?
sampling staff and lab analysis				
Limit of reporting appropriate and consistent	All Samples	Yes	No errors in limit of reporting	Yes
Completeness				
Soil description and COCs completed and appropriate	All Samples	Yes	No errors in COCs	Yes
Appropriate documentation	All Samples	Yes	No errors in documentation	Yes
Satisfactory frequency and result for QC samples	All QA/QC Samples	Yes	No reported outliers in QC report	Yes
Data from critical samples is considered valid	Critical samples	Yes	Consistency within results from critical samples	Yes

11.6 DUPLICATE SOIL RESULTS

Duplicate soil samples were taken to assess the accuracy of sampling practices.

In order to compare results of the duplicate samples to the original sample, the Relative Percent Difference (RPD) is calculated for each analyte that had results above the LOR. The RPD equals:

$$RPD\ (\%) = 100 * \frac{|\ X_A - X_B\ |}{½\ (X_A + X_B)}$$

where X_A and X_B are the levels of analytes of original sample A and duplicate sample B respectively. RPD values for duplicate samples can be found below in **Tables 11-2, 11-3 and 11-4.** All test results are included in **Attachment 7**.

Table 11-2: Duplicate Results RPD% - TRH & BTEX

Analyte	Original Result	Duplicate Result	Duplicate RPD
	EPICSS1C	**EPICSS1CC**	
TRH F1	<10	<10	0
TRH F2	<50	<50	0
Benzene	<0.2	<0.2	0
Toluene	<0.5	<0.5	0
Ethylbenzene	<0.5	<0.5	0
Total Xylenes	<0.5	<0.5	0
	EPICSS2A	**EPICSS2AA**	
TRH F1	<10	<10	0
TRH F2	<50	<50	0
Benzene	<0.2	<0.2	0
Toluene	<0.5	<0.5	0
Ethylbenzene	<0.5	<0.5	0
Total Xylenes	<0.5	<0.5	0
	EPICSS3B	**EPICSS3BB**	
TRH F1	<10	<10	0
TRH F2	<50	<50	0
Benzene	<0.2	<0.2	0
Toluene	<0.5	<0.5	0
Ethylbenzene	<0.5	<0.5	0
Total Xylenes	<0.5	<0.5	0

Note: TRH means Total Recoverable Hydrocarbons

Table 11-3: Duplicate Results RPD% - Nutrients

Analyte	Original Result	Duplicate Result	Duplicate RPD (%)
	EPICSS1C	**EPICSS1CC**	
Ammonia as N	<20	<20	0
Nitrite as N (Sol.)	3.4	1	109
Nitrate as N (Sol.)	6.7	1.2	139
Nitrite+Nitrate as N (Sol.)	10.1	2.2	128
Total Kjedahl Nitrogen as N	650	540	18.5
Total Nitrogen as N	660	540	20
Total Phosphorus as P	229	149	42.3
	EPICSS2A	**EPICSS2AA**	
Ammonia as N	<20	<20	0
Nitrite as N (Sol.)	0.3	0.2	40
Nitrate as N (Sol.)	1.1	2.2	66.7
Nitrite+Nitrate as N (Sol.)	1.4	2.4	52.6
Total Kjedahl Nitrogen as N	1850	2210	17.7
Total Nitrogen as N	1850	2210	17.7
Total Phosphorus as P	484	509	5
	EPICSS3B	**EPICSS3BB**	
Ammonia as N	<20	<20	0
Nitrite as N (Sol.)	1.4	1.5	6.9
Nitrate as N (Sol.)	2.2	1.8	20
Nitrite+Nitrate as N (Sol.)	3.6	3.3	8.7
Total Kjedahl Nitrogen as N	760	880	14.6
Total Nitrogen as N	760	880	14.6
Total Phosphorus as P	187	214	13.5

Table 11-4: Duplicate Results RPD% - Pesticides

Analyte	Original Result	Duplicate Result	Duplicate RPD
	EPICSS1C	**EPICSS1CC**	
Organochlorine Pesticides	<LORs	<LORs	0
Organophosphorus Pesticides	<LORs	<LORs	0
	EPICSS2A	**EPICSS2AA**	
Organochlorine Pesticides	<LORs	<LORs	0
Organophosphorus Pesticides	<LORs	<LORs	0
	EPICSS3B	**EPICSS3BB**	
Organochlorine Pesticides	<LORs	<LORs	0
Organophosphorus Pesticides	<LORs	<LORs	0

It should be noted that since all Organochlorine (OC) and Organophosphorus (OP) Pesticides were below the Level of Reporting (LOR), there was no reason to repeat these pesticides in the above table. A list of all pesticides is included in Attachment 7.

12. ANALYTICAL RESULTS

12.1 SOIL ANALYTICAL RESULTS

Soil samples were analysed as outlined in Section 9. A summary of the results are shown in **Tables 12-1, 12-2, 12-3** and **12-4** below. Actual sample analysis reports from ALS are provided in **Attachment 7**.

Results are compared to the soil assessment criteria values obtained from different policies and guidelines. In the following tables, red indicates values that exceed one or more of the assessment criteria. It should be noted that the intention of this comparison is not to determine compliance or not with these assessment criteria but rather as an indication of the extent of contamination for the determination of the baseline values of these contaminants.

Table 12-1: Soil Results for TRH/BTEX – mg/kg

	Analyte and Assessment Criteria					
	(F1) TRH C_6-C_{10}	(F2) TRH C_{10}-C_{16}	Benzene	Toluene	Ethylbenzene	Total Xylenes
NEPM 2013 HIL-D	-	-	-	-	-	-
NEPM 2013 HSL (silt 0–<1 m)	-	NL	-	-	-	-
NEPM 2013 HSL (silt1–<2 m)	-	NL	-	-	-	-
NEPM 2013 HSL (silt 2–<4 m)	-	NL	-	-	-	-
NEPM 2013 HSL (silt > 4 m)	NL	NL	10	-	-	-
NEPM 2013 ESL (fine)	180	120	65	105	125	45
NEPM 2013 Management Limit (fine soil)	-	-	-	-	-	-
NSW EPA Service Station	-	-	-	-	-	-
Sample ID						
EPICSS1A	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS1B	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS1C	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS1CC*	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS2A	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS2AA*	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS2B	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS2C	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS3A	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS3B	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS3BB*	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS3C	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS4A	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS4B	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS4C	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS5A	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS5B	<10	<50	<0.2	<0.5	<0.5	<0.5
EPICSS5C	<10	<50	<0.2	<0.5	<0.5	<0.5

Table 12-2: Soil Results for Nutrients – mg/kg

Sample ID	Analyte						
	Ammonia as N	Nitrite as N (Sol.)	Nitrate as N (Sol.)	Nitrite+ Nitrate as N (Sol.)	Total Kjedahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P
EPICSS1A	<20	0.2	2.8	3.0	2410	2410	405
EPICSS1B	<20	1.2	.7	1.9	1250	1250	255
EPICSS1C	<20	3.4	6.7	10.1	650	660	229
EPICSS1CC*	<20	1	1.2	2.2	540	540	149
EPICSS2A	<20	0.3	1.1	1.4	1850	1850	484
EPICSS2AA*	<20	0.2	2.2	2.4	2210	2210	509
EPICSS2B	<20	0.9	4.4	5.3	1040	1040	221
EPICSS2C	<20	5.5	18.3	23.8	430	450	105
EPICSS3A	<20	1.2	1.4	2.6	2260	2260	459
EPICSS3B	<20	1.4	2.2	3.6	460	760	187
EPICSS3BB*	<20	1.5	1.8	3.3	880	880	214
EPICSS3C	<20	1.3	1.7	3.0	700	700	185
EPICSS4A	<20	1.1	2.5	3.6	2600	2600	639
EPICSS4B	<20	0.8	1.1	1.9	1850	1850	412
EPICSS4C	<20	2.6	8.7	11.3	570	580	184
EPICSS5A	<20	0.4	1.5	1.9	1520	1520	665
EPICSS5B	<20	0.9	0.5	1.4	1130	1130	580
EPICSS5C	<20	0.4	0.6	1.0	440	440	129

Table 12-3: Moisture Content Soil Results - %

Sample ID	Moisture
EPICSS1A	17.2
EPICSS1B	16.5
EPICSS1C	18.4
EPICSS1CC*	19.3
EPICSS2A	16.3
EPICSS2AA*	21.6
EPICSS2B	16.1
EPICSS2C	19
EPICSS3A	12.7
EPICSS3B	16.2
EPICSS3BB*	19.9
EPICSS3C	16.2
EPICSS4A	18.2
EPICSS4B	12.4
EPICSS4C	15.4
EPICSS5A	13.9
EPICSS5B	16.5
EPICSS5C	21.1

Table 12-4: Soil Results for OC/OP Pesticides – mg/kg

Sample ID	Analyte	
	Organochlorine Pesticides (OC)	Organophosphorus Pesticides (OP)
EPICSS1A	<LORs	<LORs
EPICSS1B	<LORs	<LORs
EPICSS1C	<LORs	<LORs
EPICSS1CC*	<LORs	<LORs
EPICSS2A	<LORs	<LORs
EPICSS2AA*	<LORs	<LORs
EPICSS2B	<LORs	<LORs
EPICSS2C	<LORs	<LORs
EPICSS3A	<LORs	<LORs
EPICSS3B	<LORs	<LORs
EPICSS3BB*	<LORs	<LORs
EPICSS3C	<LORs	<LORs
EPICSS4A	<LORs	<LORs
EPICSS4B	<LORs	<LORs
EPICSS4C	<LORs	<LORs
EPICSS5A	<LORs	<LORs
EPICSS5B	<LORs	<LORs
EPICSS5C	<LORs	<LORs

It should be noted that since all Organochlorine (OC) and Organophosphorus (OP) Pesticides were below the Level of Reporting (LOR), there was no reason to repeat these pesticides in the above table. A list of all pesticides is included in Attachment 7.

13. CONCLUSIONS AND RECOMMENDATIONS

Based on our inspections of the relevant portion of the land and our extensive experience with similar environmental assessments and environmental risk assessments, the findings of the Site Investigation are outlined below. In addition, other than agriculture activities, the site has not been subjected previously to any industrial or commercial activities that are likely to cause or have the potential to cause any contamination.

The contamination of soil or subsoil was not detected and is unlikely to be of concern except for the nutrients as outlined in this document. Based on the results and findings presented in this document, the site is considered to be suitable for the proposed development as designed which includes the semi-impervious to impervious areas which will cover the active working areas.
The presence of free asbestos (asbestos fragment) was not found anywhere within the subject area.

Based on the observations made during the inspections, it appears that the use of herbicides and pesticides has been very limited to certain areas in the vicinity of the dwellings and sheds, and that all chemicals used are most likely to have been of domestic grades which are generally bio-degradable. These are similar to those used by most householders in Australia. None of the old persistent organic pesticides were used. This was extremely important to note to ensure that the livestock using the land for grazing many years ago were not adversely affected by these chemicals.

In summary, there was no visible contamination of any type within the investigation area nor were there any undesirable odours detected. Only limited nutrient contamination at different levels were found but were very consistent across the area at different depths below ground level and were not of any concern to impact on farming of pastures or livestock in future following the completion of the proposed development. These nutrients will not be impacted on by the proposed stockpiling activities since excavations/earthworks are not proposed as part of the site establishment. On the contrary, the stockpiling footprint will be covered with a layer of VENM between 300-700 mm to provide safe and environmentally responsible working surface. Simply stockpiling activities will not interfere with the existing soil or have the potential to alter the existing quality of soil since the stockpiled materials are clean Virgin Excavated Natural Materials that are excavated from the adjacent Luddenham quarry and are not chemically altered. The only pollutant that is likely to be generated would be sediment which will be filtered through the proposed cap and sediment laden water runoff will be drained to the proposed sediment pond to be constructed at the most south eastern corner of the site.

To provide all stakeholders including the proponent, the land owner, the community, and Government and non-Government organisations with much higher confidence that the proposed development will improve the land, it is recommended that a soil sampling program be prepared and implemented at the same locations where the benchmark sampling stations have been established. The program should include soil sampling on a 5-yearly basis or at the end of the development life if it is less than 5 years.

A Stage 2 Detailed Site Contamination Assessment is not required.

14. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for the preparation of site investigations. No guarantees are either expressed or implied.

This PSI has been prepared solely for the use of Epic Mining Pty Limited, as per our agreement for providing environmental services. Only of Epic Mining Pty Limited are entitled to rely upon the information provided in this site investigation within the scope of work described in this document. Otherwise, no responsibility is accepted for the use of any part of this site investigation by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this site investigation report, no warranty is given, nor liability accepted (except what otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Epic Mining Pty Limited for the purposes of preparing this site investigation.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

15. REFERENCES

1 Guidelines for Consultants Reporting on Contaminated Sites (OEH September 2011)

2 Guidelines for the NSW Site Auditor Scheme (NSW EPA, 2006)

3 Contaminated Land Management Act 1997

4 NSW DUAP & NSW EPA: Managing Land Contamination – Planning Guidelines – SEPP 55 - Remediation of Land - 1998

5 The National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) as amended in 2013

6 Protection of the Environment Operations Act 1997

7 Environmental Planning & Assessment Act 1979

8 Environmental Planning and Assessment Regulation, 2000

9 Liverpool Local Environmental Plan 2008

10 Liverpool Development Control Plan 2008

11 Work Health and Safety Act 2011

12 Work Health and Safety Regulation 2011

13 Managing Urban Stormwater – Soils and Construction – Volume 1 – 4th Edition – March 2004 – Landcom

ATTACHMENTS

Attachment 1: Historical Aerial Views

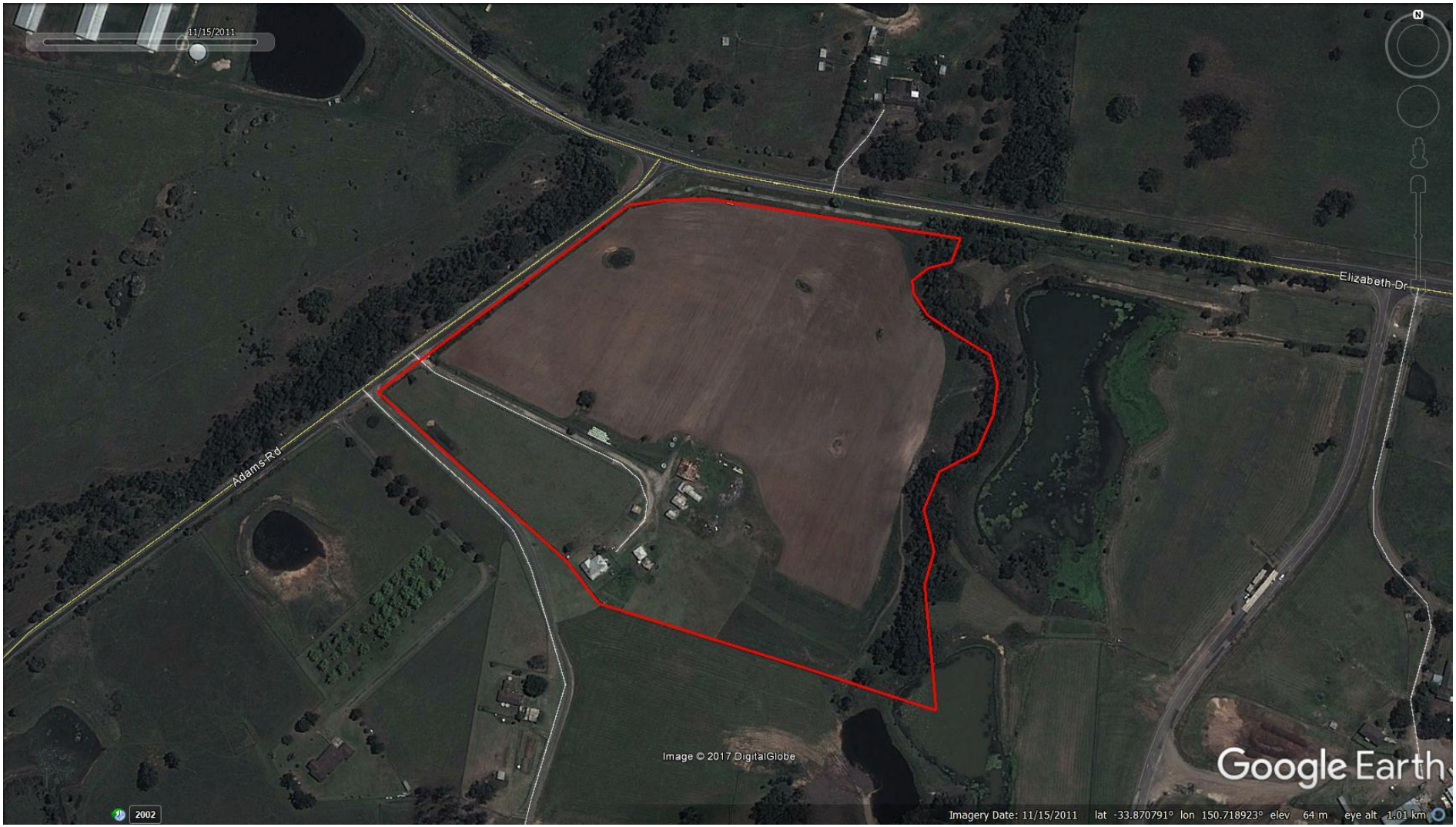
Historical Aerial View taken on 18/09/2005

Historical Aerial View taken on 17/04/2006

Historical Aerial View taken on 11/03/2007

Historical Aerial View taken on 30/06/2009

Historical Aerial View taken on 15/11/2011



Historical Aerial View taken on 24/11/2012

Historical Aerial View taken on 06/11/2013

Historical Aerial View taken on 14/12/2014

Historical Aerial View taken on 16/10/2015

Historical Aerial View taken on 05/05/2016

Historical Aerial View taken on 22/11/2016

Attachment 2: Section 149 (2&5) Certificates

LIVERPOOL CITY COUNCIL

PLANNING CERTIFICATE UNDER SECTION 149
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Ref.: EPICEAR 17 42642
Ppty: 7878

Cert. No.: 3054
Page No.: 1 of 12

Applicant:
MR N ISRAEL
PO BOX 150
SEVEN HILLS NSW 1730

Receipt No.: 3388780
Receipt Amt.: 133.00
Date: 09-Mar-2017

The information in this certificate is provided pursuant to Section 149(2)&(3) of the Environmental Planning and Assessment Act (EP&A Act) 1979, as prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation (EP&A Regulation) 2000. The information has been extracted from Councils records, as they existed at the date listed on the certificate. Please note that the accuracy of the information contained within the certificate may change after the date of this certificate due to changes in legislation, planning controls or the environment of the land.

The information in this certificate is applicable to the land described below.

Legal Description: DP 571171 Cnr Lot 2&1
Street Address: 2470 ELIZABETH DRIVE, LUDDENHAM NSW 2745

Note: Items marked with an asterisk (*) may be reliant upon information transmitted to Council by a third party public authority. The accuracy of this information cannot be verified by Council and may be out-of-date. If such information is vital for the proposed land use or development, applicants should instead verify the information with the appropriate authority.

Note: Commonly Used Abbreviations:
LEP: Local Environmental Plan
DCP: Development Control Plan
SEPP: State Environmental Planning Policy
EPI: Environmental Planning Instrument

LIVERPOOL CITY COUNCIL

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Cert. No.: 5064

1. Names of relevant planning instruments and DCPs

(a) The name of each EPI that applies to the carrying out of development on the land is/are listed below:

LEPs:

Liverpool LEP2008

SEPPs*:

SEPP No 19 – Bushland in Urban Areas
SEPP No 21 – Caravan Parks
SEPP No 30 – Intensive Agriculture
SEPP No 33 – Hazardous and Offensive Development
SEPP No 44 – Koala Habitat Protection
SEPP No 50 – Canal Estate Development
SEPP No 55 – Remediation of Land
SEPP (Exempt and Complying Development Codes) 2008
SEPP No 62 – Sustainable Aquaculture
SEPP No 64 – Advertising and Signage
SEPP No 65 – Design Quality of Residential Flat Development
SEPP (Building Sustainability Index: BASIX) 2004
SEPP No. 70 – Affordable Housing (Revised Schemes)
SEPP (Infrastructure) 2007
SEPP (Mining, Petroleum Production and Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (Affordable Rental Housing) 2009
SEPP (Western Sydney Employment Area) 2009
SEPP (Housing for Seniors or People with a Disability) 2004
SEPP (State and Regional Development) 2011

Deemed SEPPs*:

SREP No 20 – Hawkesbury – Nepean River (No. 2 – 1997)

(b) The name of each draft EPI or Planning Proposal (which has been subject to community consultation).

Draft LEPs:

N/A

Draft SEPPs*:

Draft SEPP (Competition) 2010

(c) The name of each DCP that applies to the carrying out of development on the land.

Liverpool DCP 2008

2. Zoning and land use under relevant LEPs and /or SEPPs

Customer Service Centre Ground Floor, 33 Moore Street, Liverpool NSW 2170, DX 5030 Liverpool
All correspondence to Locked Bag 7064 Liverpool BC NSW 1871 Call Centre 1300 36 2170
Fax 9821 9333 Email lcc@liverpool.nsw.gov.au
Web www.liverpool.nsw.gov.au NRS 13 36 77 ABN 84 181 182 471

LIVERPOOL CITY COUNCIL

PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

This section contains information required under subclauses 2 and 2A of Schedule 4 of the EP&A Regulation 2000. Subclause 2 of the regulation requires Council to provide information with respect to zoning and land-use in areas zoned by, or proposed to be zoned by, a LEP. Subclause 2A of Schedule 4 of the regulation requires Council to provide information with respect to zoning and land-use in areas which have zoned by, or proposed to be zoned by, the SEPP (Sydney Region Growth Centres) 2006. The land use and zoning information under any EPI applying to the land is given below.

(a) Name of zone, and the EPI from which the land zoning information is derived.

RU1 Primary Production - Liverpool LEP2008

(b) The purposes for which development may be carried out within the zone without the need for development consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations

(c) The purposes for which development may not be carried out within the zone except with development consent

Agriculture; Airstrips; Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Extractive industries; Farm buildings; Farmstay accommodation; Flood mitigation works; Forestry; Hazardous storage establishments; Health consulting rooms; Helipads; Heliports; Home businesses; Home industries; Landscaping material supplies; Offensive storage establishments; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers' dwellings; Secondary dwellings; Veterinary hospitals; Water recreation structures

(d) The purposes for which the instrument provides that development is prohibited within the zone

Any development not specified in item (b) or (c)

(e) If the dwelling house is a permitted use, are there any principal development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house?

No

(f) Does the land include or comprise critical habitat?

No

(g) Is the land is in a conservation area (however described):

No

(h) Is there an item of environmental heritage (however described) situated on the land

No

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3. Complying development

The information below outlines whether complying development is permitted on the land as per the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 SEPP of the (Exempt and Complying Development Codes) 2008.

The first column identifies the code(s). The second column describes the extent of the land in which exempt and complying development is permitted for the code(s) given to the immediate left. The third column indicates the reason as to why exempt and complying development is prohibited on some or all of the land, and will be blank if such development is permitted on all of the land.

Code	Extent of the land for which development is permitted:	The reason(s) as to why development is prohibited:
General Housing Code and Rural Housing Code	Part	Part of the land is identified as being within an ANEF contour of greater than or equal to 25, unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house (Clause 1.19(1)(h))
Commercial and Industrial (New Buildings and Additions) Code	All	
General Development Code, Fire Safety Code, Housing Alterations Code, Commercial and Industrial Alterations Code, Subdivisions Code, and Demolition Code	All	

Note: If council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement below will describe that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Nil

4. Coastal protection*

Has the Department of Finance, Services and Innovation notified Council of the land being affected by 38 or 39 of the Coastal Protection Act, 1979?

No

44. Certain information relating to beaches and coasts*

(a) Has an order has been made under Part 4D of the Coastal Protection Act 1979 on the land (or on public land adjacent to that land)?

No

(b) Has Council been notified under section 55X of the Coastal Protection Act 1979 that temporary coastal protection works have been placed on the land (or on public land adjacent to that land), and if works have been so placed, is council satisfied that the works have been removed and the land restored in accordance with that Act?

Not applicable

48. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works*

Has the owner (or any previous owner) of the land consented, in writing, that the land is subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act)?

No

5. Mine subsidence*

Is the land proclaimed to mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No

6. Road widening and road realignment

Is the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993?

No

(b) An EPI?

No

(c) A resolution of the council?

No

7. Council and other public authority policies on hazard risk restrictions

The following table lists hazard/risk policies that have been adopted by Council (or prepared by another public authority and subsequently adopted by Council). The right-most column indicates whether the land is subject to those policies.

Hazard/Risk	Adopted Policy	Does this hazard/risk policy apply to the land?
Landslip hazard	Nil	No
Bushfire hazard	Liverpool DCP 2008	Yes
	Liverpool Growth Centre Precincts DCP*	No
	Edmondson Park South DCP 2012	No
	Planning for Bushfire Protection (Rural Fire Services, 2006)*	Yes
	Pleasure Point Bushfire Management Plan	No
Tidal inundation	Nil	No
Subsidence	Nil	No
Acid Sulphate Soils	Liverpool LEP 2008	No
	Liverpool DCP 2008	No
Potentially Contaminated Land	Liverpool DCP 2008	Yes, see section 10 of Part 1 of the Liverpool DCP 2008
	Liverpool Growth Centre Precincts DCP*	No
Potentially Saline Soils	Liverpool DCP 2008	Yes
	Liverpool Growth Centre Precincts DCP*	No

Note: Land for which a policy applies does not confirm that the land is affected by that hazard/risk. For example, all land for which the Liverpool DCP applies is subject to control relating to contaminated land, as this policy contains triggers and procedures for identifying potential contamination. Applicants are encouraged to review the relevant policy, and other sections of this certificate, to determine what effect, if any, the policy may have on the land.

7A. Flood related development controls information

(a) For the purpose of residential accommodation (excluding group homes or seniors housing) is the land, or part of the land, within the flood planning area and subject to flood planning controls?

No

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

(b) Is development on that land, or part of the land, for any other purpose subject to flood related development controls?

No

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

Note: Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

8. Land reserved for acquisition

Does a LEP, draft LEP, SEPP or draft SEPP identify the acquisition of the land, or part of the land, by a public authority, as referred to in section 27 of the Act?

No

9. Contribution Plans

Liverpool Contributions Plan 2009

9A. Biodiversity certified land*

Is the land, or part of the land, biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995)?

No

10. Biobanking agreements*

Is the land subject to a bio-banking agreement under Part 7A of the Threatened Species Conservation Act 1995, as notified to Council by the Chief Executive of the Office of Environment and Heritage?

No

11. Bushfire prone land

Is the land or part of the land, bushfire prone land as defined by the EP&A Act 1979?

Yes, part of the land is bushfire prone land

12. Property vegetation plans*

Is Council aware of the land being subject to a Property Vegetation Plan under the Native Vegetation Act 2003?

No, Liverpool is excluded from the operation of the Native Vegetation Act 2003

13. Orders under Trees (Disputes between Neighbours) Act 2006*

Does an order, made under the Trees (Disputes Between Neighbours) Act 2006 in relation to carrying out of work in relation to a tree on the land, apply?

No, Council has not been notified of an order

14. Directions under Part 3A*

Is there a direction (made by the Minister) that a provision of an EPI in relation to a development does not have effect?

No

15. Site compatibility certificates and conditions for seniors housing*

(a) Is there is a current site compatibility certificate (seniors housing), in respect of proposed development on the land?

No, Council has not been notified of an order.

16. Site compatibility certificates for infrastructure*

(a) Is there is a current site compatibility certificate (infrastructure), in respect of proposed development on the land?

No, Council has not been notified of an order

17. Site compatibility certificates and conditions for affordable rental housing*

Is there is a current site compatibility certificate (Affordable housing), in respect of proposed development on the land?

No. Council has not been notified of an order.

18. Paper subdivision information*

Does any development plan adopted by a relevant authority or proposed plan subject to a consent ballot apply to the land? If so the date of the subdivision order that applies to the land.

No

19. Site verification certificates*

Does a current site verification certificate, apply to the land?

No. Council is not aware of a site verification certificate

20. Loose-fill asbestos insulation *

Is a dwelling on the land listed on the register (maintained by the NSW Department of Fair Trading) as containing loose-fill asbestos insulation?

No

Note: despite any listing on the register, any buildings constructed before 1980 may contain loose-fill asbestos insulation or other asbestos products.

21. Contaminated land

Is the land:

(a) Significantly contaminated land within the meaning of that Act?

No

(b) Subject to a management order within the meaning of that Act?

No

(c) Subject of an approved voluntary management proposal within the meaning of that Act?

No

(d) Subject to an ongoing maintenance order within the meaning of that Act?

No

(e) Subject of a site audit statement within the meaning of that Act? *

No

Note: In this clause "the Act" refers to the Contaminated Land Management Act 1997.

THE FOLLOWING INFORMATION IS PROVIDED PURSUANT TO SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (EP&A ACT) 1979

1. Controlled access road

Does the land have a boundary to a controlled access road?

No

2. Sewer Access and On-site Management

On-Site Sewerage Management System/s

Council's records indicate that the property may not be connected to Sydney Water's sewerage system.

If the property is not connected and emits any waste water (sewerage) it must have an On-Site Sewerage Management System that is operating satisfactorily. It is the ongoing responsibility of the current owner(s) of the property (at any given time) to ensure that any On-Site Sewerage Management System continually operate in compliance with the relevant provisions of the Local Government Act 1993, and the Protection of the Environment Operations Act 1997 (including regulations made there under).

It is recommended that any applicant intending to purchase the property make enquires to ascertain if the property has an On-Site Sewerage Management System and engage the services of a suitably qualified wastewater engineer or plumber to assess the condition and compliance status of those system(s).

3. Other Information in Relation to Water Restrictions

Nil

4. Contaminated Land

Nil

5. Airport Noise Affectation*

The land is identified as being within an ANEF (Australian Noise Exposure Forecast) contour; as such, the development of the land may be restricted.

6. Environmentally Significant Land

Nil

7. Archaeological Management Plan

Nil

B. Offensive Odour and Rural Land Uses

Nil

Luke West
Administration Services Coordinator
Liverpool City Council

For further information, please contact
CALL CENTRE – 1300 36 2170

Attachment 3: NSW OEH AHIMS Results and Maps

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 2470 Elizabeth Dr

Client Service ID : 211520

Nicolas Israel

Date: 14 February 2016

63 Johnson Avenue
Seven Hills New South Wales 2147

Attention: Nicolas Israel

Email: 20nicolas15@gmail.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 281, DP:DP571171 with a Buffer of 200 meters, conducted by Nicolas Israel on 14 February 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

5	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 2470 Elizabeth D

Client Service ID : 2115

Nicolas Israel

Date: 14 February 20

63 Johnson Avenue
Seven Hills New South Wales 2147

Attention: Nicolas Israel

Email: 20nicolas15@gmail.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 281, DP:DP571171 with a Buffer of 50 meters, conducted by Nicolas Israel on 14 February 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

2	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Attachment 4: LLEP - Schedule 5 Environmental Heritage

Schedule 5 Environmental heritage
(Clause 5.10)
Part 1 Heritage items
Division 1 Liverpool other than Liverpool city centre

Suburb	Item name	Address	Property description	Significance	Item No
Ashcroft	Memorial gates, Ashcroft High School (former Ashcroft Homestead, St Luke's Rectory gates)	108–130 Maxwells Avenue	Lot 904, DP 225306	Local	1
Badgerys Creek	St John's Anglican Church Group, including church and cemetery (former Badgerys Creek Anglican Church Group)	Pitt Street	Part Lot 1, DP 838361	Local	2
Badgerys Creek	Badgerys Creek Public School	Corner of Pitt Street and Badgerys Creek Road	Part Lot 1, DP 838361	Local	3
Bringelly	Two water tanks (RAAF receiving station site and former water supply to OTC staff)	Badgerys Creek Road	Lot 1, DP 90328; Lot 1, DP 109666	Local	4
Bringelly	Former OTC Site Group, including radio receiving station and site of former staff housing	Badgerys Creek Road	Lot 1, DP 109666	Local	5
Bringelly	Dwelling and rural lot ("Mount Pleasant")	3 Shannon Road	Lot 44, DP 581187	Local	6
Bringelly	Bringelly Public School Group, including schoolhouse and former headmaster's	1205 The Northern Road	Lot 50, DP 746911	Local	7

	residence				
Bringelly	Kelvin Park Group, including site landscaping, homestead, kitchen wing, servant's quarters, coach house, 2 slab barns and other works and relics (former "The Retreat", cottage vale, stables and lock-up)	30 The Retreat	Lots 2711–2714, DP 1128906	State	8
Cartwright	Bridge (former Pitt Street Road Bridge)	Hoxton Park Road	Lot 16, DP 1036695	Local	55
Casula	Dwelling	28 Canberra Avenue	Lot 4, Sec C, DP 7633	Local	9
Casula	Casula Powerhouse (former power station)	Casula Road	Lots 1 and 2, DP 106957; Lot 1, DP 1115187	Local	10
Casula	Railway Viaduct	300m south of Casula Powerhouse, Main Southern Railway Line		Local	11
Casula	Two railway viaducts	Woodbrook Road, Main Southern Railway Line		Local	12
Casula	Dwelling ("Dockra")	8 Dunmore Crescent	Lot 1, DP 530893	Local	13
Casula	Dwelling	443 Hume Highway	Lot 9, DP 4158	Local	13A
Casula	Glenfield Farm Group, including homestead, barn (former dairy and stables)	Leacocks Lane	Lots 1 and 2, DP 1126484	State	14
Cecil Hills	Sydney Water Supply Upper Canal	Leppington and Denham Court	Lot 1, DP 725231; Lots 1–4, DP 596351	State	15

Cecil Hills	Cecil Hills Farm Group, including site landscaping, homestead, shearing shed, archaeological sites, garage, stables, cow bails, outbuildings, sheep dip, gallows and stockyards (former kitchen and dairy)	Sandringham Drive	Lot 163, DP 880335	State	16
Chipping Norton	Chipping Norton Public School	4 Central Avenue	Lot 1, DP 194411; Lot 1, DP 601876; Lot 299, DP 752034	Local	18
Chipping Norton	The Homestead Group, including main house and remnant landscape features and cistern	Charlton Avenue	Part Lot 354, DP 752034; Lot 1, DP 644571	State	19
Chipping Norton	Dwelling	2 and 4 Epsom Road	Cnr Lot 2000, DP 1140651	Local	20
Chipping Norton	Palm trees (Phoenix canariensis)	Corner of Governor Macquarie Drive and Epsom Road	Adjacent to Lot 3, DP 602936	Local	21
Chipping Norton	Avenue of trees	Riverside Park, fronting Riverside Road	Lots 62 and 63, Sec 2, DP 2411; Lot 7017, DP 1028106; Lot 17, DP 662900	Local	22
Denham Court	St Mary the Virgin Church and Cemetery Group, including church and churchyard	Church Road	Lot 19, DP 725739	Local	23
Greendale	Shadforth Monument (former pioneer's	Greendale Road	Western side of Greendale Road, adjacent to the common	Local	24

	monument)		boundary of Lot 1, DP 520904 and Part Lot 1, DP 236562		
Greendale	Private dwelling (former St Mark's Anglican Church Group, including church cemetery)	Greendale Road	Lot 1, DP 742417	Local	25
Greendale	Greendale Roman Catholic Cemetery	Greendale Road	Lot 1, DP 195955	Local	26
Greendale	Remnants of former farm homestead ("Pemberton")	Greendale Road	Lots 1 and 2, DP 1115589	Local	27
Greendale	Bents Basin Inn site	Wolstenholme Avenue	Lots 203 and 204, DP 249320; Lots 84 and 85, DP 751294	Local	28
Hammondville	Hammondville Home for Senior Citizens	Judd Avenue	Cnr Lot 100, DP 1148191; Lot 152, DP 717956	Local	29
Hammondville	St Anne's Anglican Church	Corner of Walder Road and Stewart Avenue	Lot 4, DP 238694	Local	30
Holsworthy	Holsworthy pedestrian bridge (former railway bridge)	Harris Creek and Heathcote Road		Local	31
Holsworthy	Holsworthy Group, including powder magazine and former officers' mess, corporals' club, internment camp, Holsworthy railway station lock-up/gaol, German concentration camp	Heathcote Road (off)	Lot 1, DP 825745	Local	32
Holsworthy	Remount Park	Heathcote Road	Lot 258, DP 854592; Lot 1,	Local	33

			DP 825745		
Holsworthy	Cubbitch Barta National Estate	Old Illawarra Road	Lot 1, DP 825745	Local	34
Horningsea Park	Horningsea Park Group, including site, main house and archaeological features	Camden Valley Way and Horningsea Park Drive	Lots 1 and 2, DP 1018964	State	35
Ingleburn	Ingleburn village site and lecture hall building (Nissen hut)	Campbelltown Road	Part Lots 1 and 2, DP 831152	Local	36
Ingleburn	Ingleburn Military Heritage Precinct	Campbelltown Road	Part Lot 2, DP 831152	State	37
Leppington	Row of Bunya Pines	Bringelly Road	Lot 18, DP 19406	Local	39
Leppington	Brown Memorial and water trough	145 Bringelly Road	Lot 1, DP 725231	Local	40
Leppington	Dwelling and rural lot	1720 Camden Valley Way	Lot 6, DP 205472	Local	41
Liverpool	Obelisk and milestone, Discovery Park, Collingwood Heritage Precinct	40 Atkinson Street	Lot 77, DP 27242	Local	42
Liverpool	Collingwood Heritage Precinct Group, including homestead service wing, horse trough and cistern (former Captain Bunker's Cottage and kitchen block)	Birkdale Crescent (off)	Lot 803, DP 244820; Lot 77, DP 27242; Lots 100 and 101, DP 788434; Lot 2, DP 730829; Lot 781, DP 244820; Lot 184, DP 241158	State	43
Liverpool	2 railway viaducts	Adjacent to 71 and 79A Congressional Drive		Local	44
Liverpool	Mainsbridge School (former "Maryvale")	118 Flowerdale Road	Lot 1, DP 441857	Local	45

Liverpool	Liverpool General Cemetery	Moore and McLean Streets and Flowerdale Road	Lots 6, 7 and 13, Ms 652 Sy; Lots 3 and 10 and Part Lots 4 and 5, Ms 10005 Sy; Lot 14, Ms 22433 Sy; Lot 11, Ms 20611 Sy; Lots 16 and 17, DP 40453; Lots 425 and 426, DP 48284; Lots 443–445, DP 822281; Lot 7030, DP 1059048; Lot 7044, DP 1045353; Lots 7047 and 7048, DP 1059854	Local	47
Liverpool	Dwelling	10 Passefield Street	Lot 1, DP 129637	Local	48
Luddenham	Willmington Reserve	17 Jamison Street	Lot 7004, DP 93052	Local	50
Luddenham	Vicary's Winery Group, including woolshed, slab horse shed, land area and main house and garden	The Northern Road	Part Lot 1, DP 838361	Local	51
Luddenham	Luddenham Public School	The Northern Road	Lot 1, DP 194409	Local	52
Luddenham	Lawson's Inn site (former "The Thistle" site)	2155 The Northern Road	Lots 1 and 2, DP 851626	Local	53
Lurnea	Dwelling	147 Reilly Street	Lot 7, DP 26166	Local	54
Lurnea	Dwelling	20 Webster Road	Lot 2, DP 519683	Local	54A
Moorebank	Clinch's Pond	Heathcote and Church Roads	Lot 1, DP 664816	Local	56
Moorebank	Australian Army Engineers Group, including RAE Memorial Chapel, RAE Monument,	Moorebank Avenue	Lots 3001–3005, DP 1125930	Local	57

	Major General Sir Clive Steele Memorial Gates, Cust Hut				
Moorebank	Defence National Storage and Distribution Centre	Moorebank Avenue	Lot 1, DP 1048263	Local	57A
Moorebank	Kitchener House (formerly “Arpafeelie”)	Moorebank Avenue	Lot 1001, DP 1050177	Local	58
Prestons	Remnants of former sandstone cottage (“Benera”)	Yarrunga Road	Lot 34, DP 2359	Local	59
Rossmore	Church of the Holy Innocents Group, including church and churchyard	Church Street	Lots 1–4, DP 117688	Local	60
Rossmore	Bellfield Farm Group, including homestead, slab kitchen, slab cottage and smoke house	33 Rossmore Avenue	Lot 1, DP 580979	Local	61
Sadleir	Memorial stone and plaque	147 Cartwright Avenue (corner of Maxwells Avenue)	Part Lot 735, DP 533701	Local	62
Voyager Point	Sandstone Weir	Williams Creek		Local	63
Warwick Farm	Milestone	Hume Highway (southern side of Hume Highway between George Street and Browne Parade)		Local	64
Warwick Farm	Milestone	Hume Highway (southern side of Hume Highway between Warwick Farm Racecourse Gates A and B)		Local	65

Warwick Farm	Warwick farm Racecourse Group	Hume Highway	Lot 1, DP 250138; Lots 2 and 3, DP 1040353; Lot 14, DP 578199; Part Lot 1, DP 1040353; Lots 1–3, DP 581034; Lot 1 DP 970591; Lots 1–3, DP 249818; Part Lot 2, DP 581037	Local	66
West Hoxton	West Hoxton Union Church	Kirkpatrick Avenue	Lot 474, DP 666892	Local	68

Division 2 Liverpool city centre

Suburb	Item name	Address	Property description	Significance	Item no
Liverpool	Light Horse Park	Atkinson Street	Lots 3, 7, 11 and 15, DP 1129945	Local	70
Liverpool	Liverpool Public School	Bigge Street	Lots 8 and 9, Sec 61, DP 758620; Lots 1, 2 and 4, DP 878452; Lot 1, DP 50779; Lot 1, DP 178206; Lot 1, DP 178665; Lot 10, DP 303625; Lot 1, DP 956168; Lot 4, DP 797682; Lots 30 and 31 DP 1117676	Local	71
Liverpool	Liverpool Railway Station Group, including station building, goods shed and jib crane	Bigge Street (off)	Lot 31, DP 859887; Part Lot 5, DP 226933	State	72
Liverpool	Former Liverpool Court House	Corner of Bigge and Moore Streets	Lot 442, DP 831058	Local	73
Liverpool	Commercial Hotel (former Marsden's Hotel)	Bigge and Scott Streets	Lot 17, DP 1050799; Lots 15, 16 and 18, DP 979379	Local	74
Liverpool	Dwelling	13 Bigge Street	Lots 1 and 2, DP 13930	Local	75

Liverpool	Pirelli Power Cables and Systems Building (formerly MM Cables Factory, and Cable Makers Australia Factory Pty Ltd)	3 Bridges Road	Lot 200, DP 1009044	Local	76
Liverpool	Dwelling	115 Castlereagh Street	Lot 4, SP 39972	Local	77
Liverpool	Lyndeer House and stables	2 Charles Street	Lot 2527, DP 1111436	Local	78
Liverpool	Cast-iron letterbox	College Street	Adjacent to north-west corner of Lot 1, DP 863491	Local	79
Liverpool	Liverpool College (TAFE) site, including Blocks A–G, chimneystack, fences, gatehouses and archaeological features (formerly Liverpool Hospital and Benevolent Asylum)	College Street	Lot 1, DP 863491	State	80
Liverpool	Apex Park (first Liverpool Cemetery)	Elizabeth Drive and Castlereagh Street	Lot 7027, DP 1027999	Local	81
Liverpool	Bigge Park	Elizabeth, College, Moore and Bigge Streets	Lot 702, DP 1056246	Local	82
Liverpool	Milestone	Corner of Elizabeth Drive and George Street		Local	83
Liverpool	St Luke's Anglican Church Group, including landscaping, church, hall, headstone and	Elizabeth Drive and Macquarie and Northumberland Streets	Lot 111, DP 552031	State	84

	memorial gates (former St Luke's Church of England)				
Liverpool	All Saints Roman Catholic Church	George Street	Lot 1, DP 782355	Local	85
Liverpool	Pylons (former Liverpool railway bridge)	Georges River (near Haig Avenue)	Near Lot 7002, DP 1073063	Local	86
Liverpool	Liverpool Weir	Georges River (near Haig Avenue)	Near Lot 7002, DP 1073063	State	87
Liverpool	Collingwood Inn Hotel	Hume Highway	Land in DP 83770; Lots 1 and 2, DP 563488; Lot 5, DP 201018; Lot D, DP 374057	Local	88
Liverpool	Plan of Town of Liverpool (early town centre street layout – Hoddle 1827)	Streets in the area bounded by the Hume Highway, Copeland Street, Memorial Avenue, Scott Street, Georges River and Main Southern Railway Line (excluding Tindall Avenue and service ways)		Local	89
Liverpool	Liverpool Memorial Pioneer's Park, (formerly St Luke's Cemetery and Liverpool Cemetery)	Macquarie, Campbell and Northumberland Streets and the Hume Highway	Lots 7035 – 7037, DP 1073993; Part Lots 1 and 2, Sec 24, DP 758620; Lots 1 – 4, Sec 34, DP 758620	Local	90
Liverpool	Commercial building (formerly Rural Bank and State Bank)	Macquarie Street and Memorial Avenue	Lot 11, DP 20730	Local	91
Liverpool	Boer War Memorial, including	Corner of Macquarie Street and		Local	92

	memorial to Private A.E Smith	Memorial Avenue (Macquarie Street public footpath adjacent to 297 Macquarie Street)				
Liverpool	Macquarie Monument	Corner of Macquarie and Scott Streets (Macquarie Street public footpath adjacent to 296 Macquarie Street)			Local	93
Liverpool	Row of 3 palm trees	Macquarie Street median strip, opposite 306 Macquarie Street	Lot 1, 119905	DP	Local	94
Liverpool	The Corner Pub (former Liverpool Hotel)	214 Macquarie Street (corner of Moore Street)	Lot 1, 111765	DP	Local	95
Liverpool	Commercial building	261–263 Macquarie Street	Lot 1, DP 200052; Lot 8, DP 1103087		Local	96
Liverpool	Legend Hotel	269 Macquarie Street	Lot 1, 519133	DP	Local	97
Liverpool	Commercial building	275–277 Macquarie Street	Lot 2, 519133	DP	Local	98
Liverpool	Memorial School of Arts	306 Macquarie Street	Lot 1, 119905	DP	Local	99
Liverpool	Dr James Pirie Child Welfare Centre Building (formerly Child Welfare Centre)	Moore and Bigge Streets	Lot 701, 1056246	DP	Local	100
Liverpool	Commercial building	14 Scott Street	Lot 1, 208270	DP	Local	101
Liverpool	Commercial building (former out-building to former Golden Fleece Hotel and former Eugene's laundry)	16 Scott Street	Lot 3, 588103	DP	Local	102

Liverpool	Golden Fleece Hotel	Corner of Scott and Terminus Streets	Lot 100, DP 716185	Local	103
Liverpool	McGrath Services Centre Building (formerly Challenge Woollen Mills, and Australian Paper Company's Mill)	Shepherd and Atkinson Streets	Lot 1, DP 247485	Local	104
Liverpool	Railway Viaduct	Shepherd Street and Mill Road, Main Southern Railway Line		Local	105
Liverpool	Residential building ("Del Rosa")	7 Speed Street	Lots 13 and 14, DP 13536	Local	106
Liverpool	Residential building ("Rosebank") (former Queen's College)	17 Speed Street	Lot 1, DP 567283	State	107
Liverpool	Cottage	27 Speed Street	Lot 40, DP 1091733	Local	108
Liverpool	Liverpool Fire Station	70–78 Terminus Street	Lot 1, DP 91748	Local	109
Warwick Farm	Berryman Reserve	4 Remembrance Drive	Lot 1, DP 744448; Lot A, DP 432628	Local	110

Part 2 Heritage conservation areas

Division 1 Liverpool other than Liverpool city centre

Suburb	Item name	Address	Property description	Significance	Item no

Nil

Division 2 Liverpool city centre

Suburb	Item name	Address	Property description	Significance	Item no
Liverpool	Bigge Park Conservation Area	Area bounded by and including College, Goulburn, Railway, Scott and Bigge Streets as shown hatched red on the	Lot 1, DP 234608; Lot 2, DP 579808	Local	

Heritage Map

Part 3 Archaeological sites

Suburb	Item Name	Address	Property Description
Nil			

Attachment 5: Sampling Stations/Borehole Logs

BOREHOLE LOG

Borehole No: 1

Date: 06/06/2017

EPIC 1

Client: Epic Mining Pty Limited	Job Number: 171002
Project: Stage 1	Contractor: NICS
Location: 2470 Elizabeth Dr, Luddenham	Logged by: N Israel
Borehole Diam.: 220 mm	Borehole Depth: 0.7m
Commenced: 06/06/17	Completed: 06/06/17

Depth	Visual	GEOLOGICAL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content, Consistency (Geological Origin) PID (ppm)	COMMENTS (Field Rank, Odour, Visual Blow Count, Other)	PID (ppm)	Graphic Log	Method	Water	Monitor Well Details
0.0		GROUND SURFACE Loose soil – Silty, grey brown – Soft, grey clay – low to medium plasticity Yellow brown clay	No odour	0 0 0		PA + SC	No No No	
0.3								
0.7								
1.0								
2.0								
3.0								

Method

SV – Solid Flight Auger with V-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core
AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY - Cyclone
SC – Scoop
PA – Petrol Driven Auger

BOREHOLE LOG

Borehole No: 2

Date: 06/06/2017

EPIC2

Client: Epic Mining Pty Limited	Job Number: 171002
Project: Stage 1	Contractor: NICS
Location: 2470 Elizabeth Dr, Luddenham	Logged by: N Israel
Borehole Diam.: 1.2m X 2.5m	Borehole Depth: 0.7m
Commenced: 06/06/17	Completed: 06/06/17

Depth	Visual	GEOLOGICAL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content, Consistency (Geological Origin) PID (ppm)	COMMENTS (Field Rank, Odour, Visual Blow Count, Other)	PID (ppm)	Graphic Log	Method	Water	Monitor Well Details
0.0		GROUND SURFACE						
		loose soil – silt grey brown. soft	No odour	0		TP	No	
0.3		grey clay – low to medium plasticity.		0		+		
						SC	No	
0.7		Yellow & grey clay		0				
							No	
1.0								
2.0								
3.0								

Method

SV – Solid Flight Auger with V-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core
AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY - Cyclone
SC – Scoop
PA – Petrol Driven Auger

BOREHOLE LOG

Borehole No: 3

EPIC 3

Date: 06/06/2017

Client: Epic Mining Pty Limited	Job Number: 171002
Project: Stage 1	Contractor: NICS
Location: 2470 Elizabeth Dr, Luddenham	Logged by: N Israel
Borehole Diam.: 1.2m X 2.5m	Borehole Depth: 0.7m
Commenced: 06/06/17	Completed: 06/06/17

Depth	Visual	GEOLOGICAL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content, Consistency (Geological Origin) PID (ppm)	COMMENTS (Field Rank, Odour, Visual Blow Count, Other)	PID (ppm)	Graphic Log	Method	Water	Monitor Well Details
0.0		GROUND SURFACE loose soil – silt grey brown – soft. grey clay – low to medium plasticity. Red & grey clay	No odour	0		TP + SC	No	
0.3				0			No	
0.7				0			No	
1.0								
2.0								
3.0								

Method

SV – Solid Flight Auger with V-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core
AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY - Cyclone
SC – Scoop
PA – Petrol Driven Auger

BOREHOLE LOG

Borehole No: 4

Date: 06/06/2017

EPIC 4

Client: Epic Mining Pty Limited	Job Number: 171002
Project: Stage 1	Contractor: NICS
Location:2470 Elizabeth Dr, Luddenham	Logged by: N Israel
Borehole Diam.:	Borehole Depth:
Commenced:	Completed:

Depth	Visual	GEOLOGICAL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content, Consistency (Geological Origin) PID (ppm)	COMMENTS (Field Rank, Odour, Visual Blow Count, Other)	PID (ppm)	Graphic Log	Method	Water	Monitor Well Details
0.0		GROUND SURFACE						
		loose soil - silt grey brown - soft grey clay - low to medium plasticity	No Odour	0		TP + SC	No	
0.3				0			No	
0.7		Red & grey clay		0			No	
1.0								
2.0								
3.0								

Method

SV – Solid Flight Auger with V-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core
AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY - Cyclone
SC – Scoop
PA – Petrol Driven Auger

BOREHOLE LOG

Borehole No: 5

EPIC 5

Date: 06/06/2017

Client: Epic Mining Pty Limited	Job Number: 171002
Project: Stage 1	Contractor: NICS
Location: 2470 Elizabeth Dr, Luddenham	Logged by: N Israel
Borehole Diam.: 0.2m x 2.5m	Borehole Depth: 0.7
Commenced: 06/06/17	Completed: 06/06/17

Depth	Visual	GEOLOGICAL DESCRIPTION Material Type: USCS Group, Colour, Particle Size, Moisture Content, Consistency (Geological Origin) PID (ppm)	COMMENTS (Field Rank, Odour, Visual Blow Count, Other)	PID (ppm)	Graphic Log	Method	Water	Monitor Well Details
0.0		GROUND SURFACE loose soil – silt grey brown – soft red clay – low to medium plasticity	No odour	0		TP + SC	No	
0.3		Red and yellow clay		0			No	
0.7				0			No	
1.0								
2.0								
3.0								

Method

SV – Solid Flight Auger with V-bit
ST – Solid Flight Auger with TC-bit
HT – Hollow Flight Auger with TC-bit
DC – Diamond Core
R – Roller/Tricore
VC – Vibra-core
AH – Air Hammer
W – Washbone
M – Mud Drilling
HA – Hand Auger
TP – Test Pit-excavator bucket

Sample Type

SP – Split Spoon
A – Auger (disturbed)
HA – Hand Auger
CY - Cyclone
SC – Scoop
PA – Petrol Driven Auger

Attachment 6: Photos of Sampling Stations

Photo 1: Sampling Station 1

Photo 2: Sampling Station 2

Photo 3: Sampling Station 3

Photo 4: Sampling Station 4

Photo 5: Sampling Station 5

Attachment 7: Raw Data – Analysis Results

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: ES1713896	Page	: 1 of 15
Client	: National Integrated Creative Solutions	Laboratory	: Environmental Division Sydney
Contact	: MR NICOLAS ISRAEL	Contact	: Customer Services ES
Address	: PO BOX 150 SEVEN HILLS 1730	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 0421776003	Telephone	: +61-2-8784 8555
Project	: NICS_EPIC 1	Date Samples Received	: 06-Jun-2017 15:30
Order number	: —	Date Analysis Commenced	: 08-Jun-2017
C-O-C number	: —	Issue Date	: 11-Jul-2017 11:12
Sampler	: NICOLAS ISRAEL		
Site	: —		
Quote number	: SYBQ/513/17		
No. of samples received	: 18		
No. of samples analysed	: 18		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
# = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EK057G: Poor duplicate precision for Total P due to sample heterogeneity. Confirmed by re-digestion and re-analysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EPICSS1A	EPICSS1B	EPICSS1C	EPICSS1CC^	EPICSS2A
			Client sampling date / time	05-Jun-2017 08:20	05-Jun-2017 08:30	05-Jun-2017 09:00	05-Jun-2017 09:01	05-Jun-2017 10:51
Compound	CAS Number	LOR	Unit	EB1713396-001	EB1713396-002	EB1713396-003	EB1713396-004	EB1713396-006
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1	%	17.2	18.6	18.4	18.8	18.8
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	0.2	1.2	8.4	1.0	0.8
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	2.8	0.7	8.7	1.2	1.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	3.0	1.8	10.1	2.2	1.4
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	20	mg/kg	2410	1260	860	640	1360
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	---	20	mg/kg	2410	1260	860	640	1360
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	2	mg/kg	406	266	228	148	484
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS1A	EPICSS1B	EPICSS1C	EPICSS1CC*	EPICSS2A
				Client sampling date / time	05-Jun-2017 08:20	05-Jun-2017 08:30	05-Jun-2017 09:00	05-Jun-2017 09:01	05-Jun-2017 10:51
Compound	CAS Number	LOR	Unit		EB1713396-001	EB1713396-002	EB1713396-003	EB1713396-004	EB1713396-006
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS1A	EPICSS1B	EPICSS1C	EPICSS1CC^	EPICSS2A
				Client sampling date / time	05-Jun-2017 08:20	05-Jun-2017 08:30	05-Jun-2017 09:00	05-Jun-2017 09:01	05-Jun-2017 10:51
Compound	CAS Number	LOR	Unit		EB1713396-001	EB1713396-002	EB1713396-003	EB1713396-004	EB1713396-006
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		86.0	127	100	102	128
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		78.8	118	93.8	108	130
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		80.3	87.8	87.1	84.0	87.6
Toluene-D8	2037-26-5	0.2	%		104	111	111	108	87.3
4-Bromofluorobenzene	460-00-4	0.2	%		88.8	107	110	108	84.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EPICSS2AA^	EPICSS2B	EPICSS2C	EPICSS3A	EPICSS3B
			Client sampling date / time	05-Jun-2017 10:52	05-Jun-2017 10:58	05-Jun-2017 11:04	05-Jun-2017 10:31	05-Jun-2017 10:33
Compound	CAS Number	LOR	Unit	EB1713396-006	EB1713396-007	EB1713396-008	EB1713396-009	EB1713396-010
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1	%	21.8	18.1	18.0	12.7	18.2
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Soil)	14797-65-0	0.1	mg/kg	0.2	0.8	6.6	1.2	1.4
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Soil)	14797-55-8	0.1	mg/kg	2.2	4.4	16.8	1.4	2.2
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Soil)	---	0.1	mg/kg	2.4	5.2	23.3	2.6	3.6
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	20	mg/kg	2210	1040	430	2280	780
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	---	20	mg/kg	2210	1040	460	2280	780
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	2	mg/kg	609	221	106	468	187
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

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Work Order : EB1713396
Client : National Integrated Creative Solutions
Project : NICS_EPIC 1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS2 AA^	EPICSS2 B	EPICSS2 C	EPICSS3 A	EPICSS3 B
				Client sampling date / time	05-Jun-2017 10:52	05-Jun-2017 10:58	05-Jun-2017 11:04	05-Jun-2017 10:31	05-Jun-2017 10:33
Compound	CAS Number	LOR	Unit		EB1713396-006	EB1713396-007	EB1713396-008	EB1713396-009	EB1713396-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS2AA^	EPICSS2B	EPICSS2C	EPICSS3A	EPICSS3B
				Client sampling date / time	05-Jun-2017 10:52	05-Jun-2017 10:58	05-Jun-2017 11:04	05-Jun-2017 10:31	05-Jun-2017 10:33
Compound	CAS Number	LOR	Unit		EB1713396-008	EB1713396-007	EB1713396-006	EB1713396-009	EB1713396-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		124	128	88.8	101	98.1
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		102	112	78.6	82.6	88.8
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		86.4	87.7	83.6	107	101
Toluene-D8	2037-26-5	0.2	%		103	111	103	118	112
4-Bromofluorobenzene	460-00-4	0.2	%		103	111	104	114	108

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EPICSS3 BB^	EPICSS3 C	EPICSS4 A	EPICSS4 B	EPICSS4 C
			Client sampling date / time	05-Jun-2017 10:34	05-Jun-2017 10:37	05-Jun-2017 10:13	05-Jun-2017 10:18	05-Jun-2017 10:20
Compound	CAS Number	LOR	Unit	EB1713396-011	EB1713396-012	EB1713396-013	EB1713396-014	EB1713396-015
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1	%	18.8	18.2	13.2	12.4	16.4
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	1.6	1.3	1.1	0.3	2.8
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	1.2	1.7	2.6	1.1	3.7
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	2.8	3.0	3.8	1.9	11.3
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	20	mg/kg	330	700	2800	1360	670
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	---	20	mg/kg	330	700	2800	1360	680
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	2	mg/kg	214	136	838	412	184
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS3 BB^	EPICSS3 C	EPICSS4 A	EPICSS4 B	EPICSS4 C
				Client sampling date / time	05-Jun-2017 10:34	05-Jun-2017 10:37	05-Jun-2017 10:13	05-Jun-2017 10:18	05-Jun-2017 10:20
Compound	CAS Number	LOR	Unit		EB1713396-011	EB1713396-012	EB1713396-013	EB1713396-014	EB1713396-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS3 BB*	EPICSS3C	EPICSS4A	EPICSS4B	EPICSS4C
				Client sampling date / time	05-Jun-2017 10:34	05-Jun-2017 10:37	05-Jun-2017 10:13	05-Jun-2017 10:18	05-Jun-2017 10:20
Compound	CAS Number	LOR	Unit		EB1713396-011	EB1713396-012	EB1713396-013	EB1713396-014	EB1713396-015
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	---	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		103	129	108	98.8	107
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		100	127	109	91.3	94.4
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		91.3	93.7	88.3	88.4	94.7
Toluene-D8	2037-26-5	0.2	%		102	111	112	111	108
4-Bromofluorobenzene	460-00-4	0.2	%		98.0	108	106	104	98.7

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	EPICSS5A	EPICSS5 B	EPICSS5C	---	---
			Client sampling date / time	05-Jun-2017 10:01	05-Jun-2017 10:04	05-Jun-2017 10:08	---	---
Compound	CAS Number	LOR	Unit	EB1713396-016	EB1713396-017	EB1713396-018	-----	-----
				Result	Result	Result	---	---
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	---	1	%	18.8	18.6	21.1	---	---
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	0.4	0.8	0.4	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	1.6	0.6	0.8	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	1.8	1.4	1.0	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	20	mg/kg	1620	1130	440	---	---
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	---	20	mg/kg	1620	1130	440	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	2	mg/kg	886	630	128	---	---
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	---	---
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS5A	EPICSS5 B	EPICSS5C	---	---
				Client sampling date / time	05-Jun-2017 10:01	05-Jun-2017 10:04	05-Jun-2017 10:08	---	---
Compound	CAS Number	LOR	Unit		EB1713396-016	EB1713396-017	EB1713396-018	-----	-----
					Result	Result	Result	---	---
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	---	---
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	<10	<10	---	---
C10 - C14 Fraction	---	50	mg/kg		<50	<50	<50	---	---
C15 - C28 Fraction	---	100	mg/kg		<100	<100	<100	---	---
C29 - C36 Fraction	---	100	mg/kg		<100	<100	<100	---	---
^ C10 - C36 Fraction (sum)	---	50	mg/kg		<50	<50	<50	---	---

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	EPICSS5A	EPICSS5B	EPICSS5C	---	---
				Client sampling date / time	05-Jun-2017 10:01	05-Jun-2017 10:04	05-Jun-2017 10:08	---	---
Compound	CAS Number	LOR	Unit		EB1713396-016	EB1713396-017	EB1713396-018	-----	-----
					Result	Result	Result	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		< 10	< 10	< 10	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		< 10	< 10	< 10	---	---
> C10 - C16 Fraction	---	50	mg/kg		<50	<50	<50	---	---
> C16 - C34 Fraction	---	100	mg/kg		< 100	< 100	< 100	---	---
> C34 - C40 Fraction	---	100	mg/kg		< 100	< 100	< 100	---	---
^ > C10 - C40 Fraction (sum)	---	50	mg/kg		<50	<50	<50	---	---
^ > C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg		<50	<50	<50	---	---
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	---	---
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	---	---
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	---	---
^ Sum of BTEX	---	0.2	mg/kg		<0.2	<0.2	<0.2	---	---
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	---	---
Naphthalene	91-20-3	1	mg/kg		< 1	< 1	< 1	---	---
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		112	97.0	97.9	---	---
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		107	99.1	93.2	---	---
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		98.8	93.2	97.1	---	---
Toluene-D8	2037-26-5	0.2	%		103	99.6	107	---	---
4-Bromofluorobenzene	460-00-4	0.2	%		103	99.2	108	---	---

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Attachment 8: Sample Receipt Notification, QA/QC Compliance Reports, Quality Control Report

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1713896**

Client	: **National Integrated Creative Solutions**	Laboratory	: Environmental Division Sydney
Contact	: MR NICOLAS ISRAEL	Contact	: Customer Services ES
Address	: PO BOX 150 SEVEN HILLS 1730	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: 20nicolas15@gmail.com	E-mail	: ALSEnviro.Sydney@alsglobal.com
Telephone	: 0421776003	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: NICS_EPIC 1	Page	: 1 of 2
Order number	: ----	Quote number	: ES2017NATINT0002 (SYBQ/513/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: NICOLAS ISRAEL		

Dates

Date Samples Received	: 06-Jun-2017 15:30	Issue Date	: 08-Jun-2017
Client Requested Due Date	: 14-Jun-2017	Scheduled Reporting Date	: **14-Jun-2017**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 2.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- 08-06-17 - This is an updated SRA which indicates the updated project name for this work order.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - NT-8S NH3, NO2, NO3, NOX, TKN, TN, TP	SOIL - S-04 TRH/BTEXN	SOIL - S-12 OC/OP Pesticides
ES1713896-001	06-Jun-2017 08:20	EPICSS1A	✓	✓	✓	✓
ES1713896-002	06-Jun-2017 08:30	EPICSS1B	✓	✓	✓	✓
ES1713896-003	06-Jun-2017 09:00	EPICSS1C	✓	✓	✓	✓
ES1713896-004	06-Jun-2017 09:01	EPICSS1CC*	✓	✓	✓	✓
ES1713896-005	06-Jun-2017 10:51	EPICSS2A	✓	✓	✓	✓
ES1713896-006	06-Jun-2017 10:52	EPICSS2AA*	✓	✓	✓	✓
ES1713896-007	06-Jun-2017 10:58	EPICSS2B	✓	✓	✓	✓
ES1713896-008	06-Jun-2017 11:04	EPICSS2C	✓	✓	✓	✓
ES1713896-009	06-Jun-2017 10:31	EPICSS3A	✓	✓	✓	✓
ES1713896-010	06-Jun-2017 10:33	EPICSS3B	✓	✓	✓	✓
ES1713896-011	06-Jun-2017 10:34	EPICSS3BB*	✓	✓	✓	✓
ES1713896-012	06-Jun-2017 10:37	EPICSS3C	✓	✓	✓	✓
ES1713896-013	06-Jun-2017 10:13	EPICSS4A	✓	✓	✓	✓
ES1713896-014	06-Jun-2017 10:18	EPICSS4B	✓	✓	✓	✓
ES1713896-015	06-Jun-2017 10:20	EPICSS4C	✓	✓	✓	✓
ES1713896-016	06-Jun-2017 10:01	EPICSS5A	✓	✓	✓	✓
ES1713896-017	06-Jun-2017 10:04	EPICSS5B	✓	✓	✓	✓
ES1713896-018	06-Jun-2017 10:08	EPICSS5C	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

NICOLAS ISRAEL

- *AU Certificate of Analysis - NATA (COA)	Email	20nicolas15@gmail.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	20nicolas15@gmail.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	20nicolas15@gmail.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	20nicolas15@gmail.com
- A4 - AU Tax Invoice (INV)	Email	20nicolas15@gmail.com
- Chain of Custody (CoC) (COC)	Email	20nicolas15@gmail.com
- EDI Format - ENMRG (ENMRG)	Email	20nicolas15@gmail.com
- EDI Format - ESDAT (ESDAT)	Email	20nicolas15@gmail.com

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: ES1713896	Page	: 1 of 9
Client	: National Integrated Creative Solutions	Laboratory	: Environmental Division Sydney
Contact	: MR NICOLAS ISRAEL	Contact	: Customer Services ES
Address	: PO BOX 150 SEVEN HILLS 1730	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 0421776003	Telephone	: +61-2-8784 8555
Project	: NICS_EPIC 1	Date Samples Received	: 05-Jun-2017
Order number	: —	Date Analysis Commenced	: 08-Jun-2017
C-O-C number	: —	Issue Date	: 11-Jul-2017
Sampler	: NICOLAS ISRAEL		
Site	: —		
Quote number	: SYBQ/513/17		
No. of samples received	: 18		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Biwandy Fadlar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Biwandy Fadlar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Component	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055 : Moisture Content (Dried @ 105-110°C) (QC Lot: 932630)									
ES1713883-001	Anonymous	EA055: Moisture Content	---	1	%	20.2	19.5	3.20	0% - 20%
ES1713896-009	EPICSS3A	EA055: Moisture Content	---	1	%	12.7	13.6	6.92	0% - 50%
EA055 : Moisture Content (Dried @ 105-110°C) (QC Lot: 932631)									
ES1713896-018	EPICSS6C	EA055: Moisture Content	---	1	%	21.1	20.1	5.11	0% - 20%
ES1713941-023	Anonymous	EA055: Moisture Content	---	1	%	11.5	10.2	11.9	0% - 50%
EK055 : Ammonia as N (QC Lot: 948236)									
ES1713896-002	EPICSS1B	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.00	No Limit
ES1713896-010	EPICSS3B	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.00	No Limit
EK057G : Nitrite as N by Discrete Analyser (QC Lot: 933644)									
ES1713896-002	EPICSS1B	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	1.2	1.0	13.3	0% - 50%
ES1713896-013	EPICSS4A	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	1.1	1.0	10.5	0% - 50%
EK059G : Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 933643)									
ES1713704-001	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	<0.1	0.1	0.00	No Limit
ES1713896-002	EPICSS1B	EK059G: Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	1.9	2.1	9.11	0% - 20%
EK059G : Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 933645)									
ES1713896-013	EPICSS4A	EK059G: Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	3.6	3.6	0.00	0% - 50%
ES1713907-004	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	---	0.1	mg/kg	0.1	<0.1	0.00	No Limit
EK061G : Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 935676)									
ES1713896-001	EPICSS1A	EK061G: Total Kjeldahl Nitrogen as N	---	20	mg/kg	2410	2170	10.5	0% - 20%
ES1713896-010	EPICSS3B	EK061G: Total Kjeldahl Nitrogen as N	---	20	mg/kg	760	750	1.25	0% - 20%
EK067G : Total Phosphorus as P by Discrete Analyser (QC Lot: 935675)									
ES1713896-001	EPICSS1A	EK067G: Total Phosphorus as P	---	2	mg/kg	405	373	8.05	0% - 20%
ES1713896-010	EPICSS3B	EK067G: Total Phosphorus as P	---	2	mg/kg	187	# 150	21.5	0% - 20%

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 931596)									
ES1713896-001	EPICSS1A	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1713896-011	EPICSS3B*	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 931596) - continued									
ES1713896-011	EPICSS38B*	EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 931596)									
ES1713896-001	EPICSS1A	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1713896-011	EPICSS38B*	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 931596) - continued									
ES1713896-011	EPICSS38B*	EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 931595)									
ES1713896-001	EPICSS1A	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
ES1713896-011	EPICSS38B*	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 931610)									
ES1713896-001	EPICSS1A	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
ES1713896-011	EPICSS38B*	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 931595)									
ES1713896-001	EPICSS1A	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
ES1713896-011	EPICSS38B*	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 931610)									
ES1713896-001	EPICSS1A	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1713896-011	EPICSS38B*	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 931610)									
ES1713896-001	EPICSS1A	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1713896-011	EPICSS38B*	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EK055: Ammonia as N (QCLot: 948236)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	25 mg/kg	96.3	80	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 933644)								
EK057G: Nitrite as N (Soil)	14797-65-0	0.1	mg/kg	<0.1	2.5 mg/kg	97.7	85	111
EK059G: Nitrite plus Nitrate as N(NOx) by Discrete Analyser (QCLot 933643)								
EK059G: Nitrite + Nitrate as N (Soil)	--	0.1	mg/kg	<0.1	2.5 mg/kg	100	88	118
EK059G: Nitrite plus Nitrate as N(NOx) by Discrete Analyser (QCLot 933645)								
EK059G: Nitrite + Nitrate as N (Soil)	--	0.1	mg/kg	<0.1	2.5 mg/kg	97.8	88	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot 935676)								
EK061G: Total Kjeldahl Nitrogen as N	--	20	mg/kg	<20	1000 mg/kg	89.7	72	106
				<20	100 mg/kg	91.3	70	122
				<20	500 mg/kg	105	74	118
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot 935675)								
EK067G: Total Phosphorus as P	--	2	mg/kg	<2	44.2 mg/kg	93.8	76	108
				<2	44.2 mg/kg	90.7	70	118
				<2	100 mg/kg	108	78	116
EP068A: Organochlorine Pesticides (OC) (QCLot 931596)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.3	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	107	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.7	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	99.3	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	106	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	84.5	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.9	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	66	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.1	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.9	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	69	115
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.1	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	75.2	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	62	124

Sub-Matrix: SOIL

Method/ Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP068A: Organochlorine Pesticides (OC) (QCLot: 931596) - continued								
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	79.9	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	88.6	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 931596)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	81.0	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.6	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	91.0	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	84.4	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	102	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	106	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	81.9	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	78.7	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	76.4	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	78.6	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	41	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 931595)								
EP071: C10 - C14 Fraction	--	50	mg/kg	<50	200 mg/kg	96.1	75	129
EP071: C15 - C28 Fraction	--	100	mg/kg	<100	300 mg/kg	103	77	131
EP071: C29 - C36 Fraction	--	100	mg/kg	<100	200 mg/kg	99.7	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 931610)								
EP080: C6 - C9 Fraction	--	10	mg/kg	<10	26 mg/kg	104	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 931595)								
EP071: >C10 - C16 Fraction	--	50	mg/kg	<50	250 mg/kg	107	77	125
EP071: >C16 - C34 Fraction	--	100	mg/kg	<100	350 mg/kg	108	74	138
EP071: >C34 - C40 Fraction	--	100	mg/kg	<100	150 mg/kg	89.0	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 931610)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68	128
EP080: BTEXN (QCLot: 931610)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.1	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.4	67	121

Sub-Matrix: BOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 931610) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	96.9	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.6	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.4	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.9	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: BOIL				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 933644)							
ES1713815-001	Anonymous	EK057G: Nitrite as N (Soil)	14797-65-0	2.5 mg/kg	102	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 933643)							
ES1713704-001	Anonymous	EK059G: Nitrite + Nitrate as N (Soil)	---	2.5 mg/kg	98.3	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 933645)							
ES1713896-013	EPICSS4A	EK059G: Nitrite + Nitrate as N (Soil)	---	2.5 mg/kg	112	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 935676)							
ES1713896-001	EPICSS1A	EK061G: Total Kjeldahl Nitrogen as N	---	500 mg/kg	# Not Determined	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 935675)							
ES1713896-001	EPICSS1A	EK067G: Total Phosphorus as P	---	100 mg/kg	104	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 931596)							
ES1713896-001	EPICSS1A	EP068: gamma-BHC	58-89-9	0.5 mg/kg	91.7	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	103	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	106	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	102	70	130
		EP068: Endrin	72-20-8	2 mg/kg	97.2	70	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	92.9	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 931596)							
ES1713896-001	EPICSS1A	EP068: Diazinon	333-41-5	0.5 mg/kg	100	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	97.8	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	81.1	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	97.5	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	95.1	70	130

Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 931595)							
ES1713896-001	EPICSS1A	EP071: C10 - C14 Fraction	---	523 mg/kg	90.4	73	137
		EP071: C15 - C28 Fraction	---	2319 mg/kg	104	53	131
		EP071: C29 - C36 Fraction	---	1714 mg/kg	123	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 931610)							
ES1713896-001	EPICSS1A	EP080: C6 - C9 Fraction	---	32.5 mg/kg	124	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 931595)							
ES1713896-001	EPICSS1A	EP071: >C10 - C16 Fraction	---	880 mg/kg	94.9	73	137
		EP071: >C16 - C34 Fraction	---	3223 mg/kg	107	53	131
		EP071: >C34 - C40 Fraction	---	1058 mg/kg	115	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 931610)							
ES1713896-001	EPICSS1A	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	113	70	130
EP080: BTEXN (QCLot: 931610)							
ES1713896-001	EPICSS1A	EP080: Benzene	71-43-2	2.5 mg/kg	104	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	104	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	106	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	108	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	108	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	104	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	:ES1713896	Page	: 1 of 10
Client	: National Integrated Creative Solutions	Laboratory	: Environmental Division Sydney
Contact	: MR NICOLAS ISRAEL	Telephone	:+61-2-8784 8555
Project	: NICS_EPIC 1	Date Samples Received	:06-Jun-2017
Site	:—	Issue Date	:11-Jul-2017
Sampler	: NICOLAS ISRAEL	No. of samples received	: 18
Order number	:—	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Laboratory Control outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EK067G: Total Phosphorus as P by Discrete Analyser	ES1713896-010	EPICSS38	Total Phosphorus as P	---	21.5 %	0% - 20%	RPDs exceed LOR based limits
Matrix Spike (MS) Recoveries							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	ES1713896-001	EPICSS1A	Total Kjeldahl Nitrogen as N	---	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Frequency of Quality Control Samples

Matrix: SOIL

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Buchi Ammonia	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA066: Moisture Content								
Soil Glass Jar - Unpreserved (EA066)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	---	---	---	08-Jun-2017	20-Jun-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							

Page	: 3 of 10
Work Order	: ES1713896
Client	: National Integrated Creative Solutions
Project	: NICS_EPIC 1

Matrix: SOIL

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK066: Ammonia as N								
Soil Glass Jar - Unpreserved (EK066)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	---	---	---	16-Jun-2017	03-Dec-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
EK067G: Nitrite as N by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK067G)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	03-Dec-2017	✓	08-Jun-2017	03-Dec-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
EK068G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK068G)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	03-Dec-2017	✓	08-Jun-2017	03-Dec-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							

Page	: 4 of 10
Work Order	: ES1713896
Client	: National Integrated Creative Solutions
Project	: NICS_EPIC 1

Matrix: SOIL

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Soil Glass Jar - Unpreserved (EK061G)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	03-Dec-2017	✓	08-Jun-2017	03-Dec-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
EK067G: Total Phosphorus as P by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK067G)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	03-Dec-2017	✓	08-Jun-2017	03-Dec-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	08-Jun-2017	19-Jul-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							

Matrix: SOIL

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068S: Organophosphorus Pesticides (QFP)								
Soil Glass Jar - Unpreserved (EP068)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	08-Jun-2017	19-Jul-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	08-Jun-2017	19-Jul-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							
Soil Glass Jar - Unpreserved (EP080)								
EPICSS1A,	EPICSS1B,	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	10-Jun-2017	20-Jun-2017	✓
EPICSS1C,	EPICSS1CC*,							
EPICSS2A,	EPICSS2AA*,							
EPICSS2B,	EPICSS2C,							
EPICSS3A,	EPICSS3B,							
EPICSS3BB*,	EPICSS3C,							
EPICSS4A,	EPICSS4B,							
EPICSS4C,	EPICSS5A,							
EPICSS5B,	EPICSS5C							

Matrix: SOIL

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
EPICSS1A, EPICSS1B, EPICSS1C, EPICSS1CC*, EPICSS2A, EPICSS2AA*, EPICSS2B, EPICSS2C, EPICSS3A, EPICSS3B, EPICSS3BB*, EPICSS3C, EPICSS4A, EPICSS4B, EPICSS4C, EPICSS5A, EPICSS5B, EPICSS5C	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	08-Jun-2017	19-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080)							
EPICSS1A, EPICSS1B, EPICSS1C, EPICSS1CC*, EPICSS2A, EPICSS2AA*, EPICSS2B, EPICSS2C, EPICSS3A, EPICSS3B, EPICSS3BB*, EPICSS3C, EPICSS4A, EPICSS4B, EPICSS4C, EPICSS5A, EPICSS5B, EPICSS5C	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	10-Jun-2017	20-Jun-2017	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
EPICSS1A, EPICSS1B, EPICSS1C, EPICSS1CC*, EPICSS2A, EPICSS2AA*, EPICSS2B, EPICSS2C, EPICSS3A, EPICSS3B, EPICSS3BB*, EPICSS3C, EPICSS4A, EPICSS4B, EPICSS4C, EPICSS5A, EPICSS5B, EPICSS5C	08-Jun-2017	08-Jun-2017	20-Jun-2017	✓	10-Jun-2017	20-Jun-2017	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: SOIL

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	33	12.12	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	18	11.11	9.52	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK057G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	6.06	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	3	18	16.67	14.29	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK057G	3	19	15.79	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Buchi Ammonia	EK055	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	6.06	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	18	5.56	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Buchi Ammonia	EK055	0	20	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	33	6.06	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: SOIL

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
TKN as N By Discrete Analyser	EK061G	1	18	5.56	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Biochl Ammonia	EK055	SOIL	In house: Referenced to APHA 4500-NH3 B&G, H Samples are steam distilled (Biochl) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Nitrite as N - Soluble by Discrete Analyser	EK057G	SOIL	In house: Referenced to APHA 4500-NO3- B. Nitrite in a water extract is determined by direct colorimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	EK058G	SOIL	In house: Referenced to APHA 4500-NO3- F. Nitrate in the 1:5 soil:water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colorimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx) - Soluble by Discrete Analyser	EK059G	SOIL	In house: Thermo Scientific Method D08727 and NEMI (National Environmental Method Index) Method ID: 9171. This method covers the determination of total oxidised nitrogen (NOx-N) and nitrate (NO3-N) by calculation. Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by direct colorimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	In house: Referenced to APHA 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrogen, each determined seperately as N.
Total Phosphorus By Discrete Analyser	EK057G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Pesticides by GC/MS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Attachment 9: Chain of Custody Forms

CHAIN OF CUSTODY

ALS Laboratory: please tick

CLIENT: NATIONAL INTEGRATED CREATIVE SOLUTIONS	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: PO BOX 150 SEVEN HILLS NSW 1730			Custody Seal Intact? Yes No N/A
PROJECT: NICS – EPIC 1	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: NICOLAS ISRAEL	CONTACT PH: 0421776008		Other comment:
SAMPLER: NICOLAS ISRAEL	SAMPLER MOBILE: 0421776003	RELINQUISHED BY: N. ISRAEL	RECEIVED BY: [signature]
COC emailed to ALS? (YES / NO) HANDED IN	EDD FORMAT (or default):	DATE/TIME: 06/06/17 @ 3.30pm	DATE/TIME: 6/6/17 3.30pm
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):			
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:			

ALS USE: LAB ID	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	AS PER ATTACHED TABLE	06/06/17	SOIL	ICE + ESKY – 18 SOIL SAMPLES	18	S4 S12 NT8S	

Environmental Division
Sydney
Work Order Reference
ES1713896

Telephone: +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

EPIC MINING SOIL SAMPLING

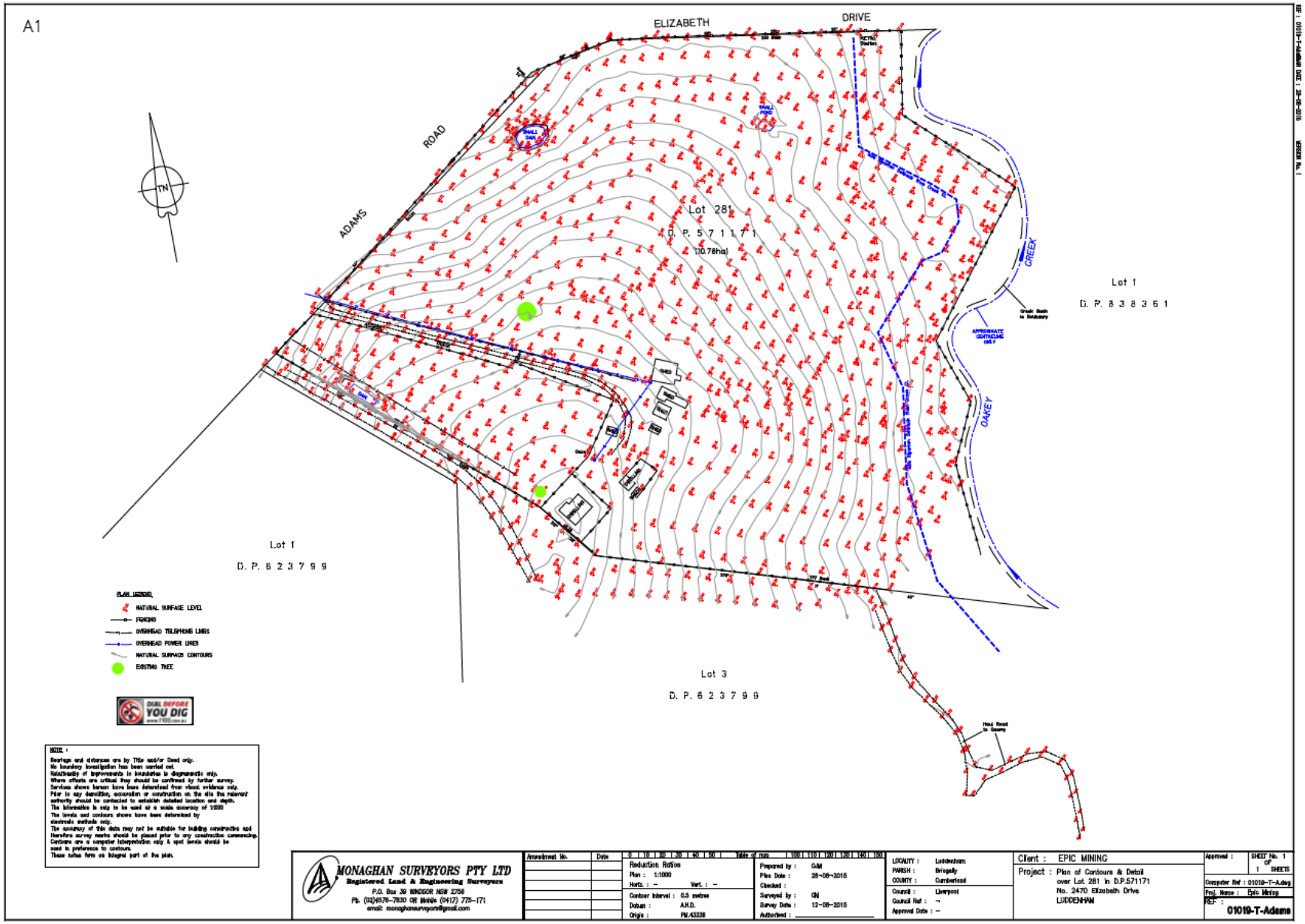
LOCATION: 2470 Elizabeth Drive, Luddenham

DATE: 6/06/2017

SAMPLING STATION ID		SAMPLE NAME	TIME	DEPTH	COMMENTS
EPIC1	1	EPICSS1A	9:10am	0-0.15m	PID= 0ppm
	2	EPICSS1B	9:30am	0.30m	
	3	EPICSS1C	9:40am	0.70m	
	4	EPICSS1CC*	9:45am	0.70m	
EPIC2	5	EPICSS2A	10:51am	0-0.15m	PID= 0ppm
	6	EPICSS2AA*	10:52am	0-0.15m	
	7	EPICSS2B	10:58am	0.30m	
	8	EPICSS2C	11:04pm	0.70m	
EPIC3	9	EPICSS3A	10:31am	0-0.15m	PID= 0ppm
	10	EPICSS3B	10:33am	0.30m	
	11	EPICSS3BB*	10:34am	0.30m	
	12	EPICSS3C	10:37am	0.65m	
EPIC4	13	EPICSS4A	10:13am	0-0.15m	PID= 0ppm
	14	EPICSS4B	10:16am	0.30m	
	15	EPICSS4C	10:21am	0.70m	
EPIC5	16	EPICSS5A	10:01am	0-0.15m	PID= 0ppm
	17	EPICSS5B	10:04am	0.30m	
	18	EPICSS5C	10:08am	0.70m	

Note: *Duplicates

Attachment 10: Copy of Site Survey


A1
ELIZABETH
DRIVE
ADAMS
ROAD
TN
Lot 281
D. P. 571171
110.78ha)
Lot 1
D. P. 838361
CREEK
OAKEY
Lot 1
D. P. 623799
Lot 3
D. P. 623799
PLAN LEGEND
NATURAL SURFACE LEVEL
FENCING
OVERHEAD TELEPHONE LINES
OVERHEAD POWER LINES
NATURAL SURFACE CONTOURS
EXISTING TREE
DIAL BEFORE YOU DIG
NOTE :
Bearings and distances are by Title and/or Deed only.
No boundary investigation has been carried out.
Relationship of improvements to boundaries is diagrammatic only.
Where offsets are critical they should be confirmed by further survey.
Services shown hereon have been determined from visual evidence only.
Prior to any demolition, excavation or construction on the site the relevant authority should be contacted to establish detailed location and depth.
The information is only to be used at a scale accuracy of 1:1000
The levels and contours shown have been determined by electronic methods only.
The accuracy of this data may not be suitable for building construction and therefore survey marks should be placed prior to any construction commencing.
Contours are a computer interpretation only & spot levels should be used in preference to contours.
These notes form an integral part of the plan.
MONAGHAN SURVEYORS PTY LTD
Registered Land & Engineering Surveyors
P.O. Box 38 WINDSOR NSW 2756
Ph. (02)4577-7830 OR Mobile (0417) 775-171
email: monaghansurveyors@gmail.com
Amendment No.
Date
Reduction Ratios
Plan : 1:1000
Horiz. : --
Vert. : --
Contour Interval : 0.5 metres
Datum : A.H.D.
Origin : PM 43338
Prepared by : GM
Plan Date : 28-09-2016
Checked :
Surveyed by : GN
Survey Date : 12-09-2016
Authorised :
LOCALITY : Luddenham
PARISH : Bringelly
COUNTY : Cumberland
Council : Liverpool
Council Ref : --
Approval Date : --
Client : EPIC MINING
Project : Plan of Contours & Detail over Lot 281 in D.P.571171 No. 2470 Elizabeth Drive LUDDENHAM
Approved :
SHEET No. 1 OF 1 SHEETS
Computer Ref : 01019-T-Adeq
Proj. Name : Epic Mining
REF : 01019-T-Adams